

# MINING WORLD

JANUARY, 1949

VOL. 17 No. 1

25c a copy

With which is combined **THE MINING JOURNAL**



**ANOTHER  
PACIFIC  
PRODUCT**

## **Pacific SHEAVE BLOCKS**

Used on hundreds of slushing operations throughout the world, Pacific Sheave Blocks have earned an outstanding reputation for dependable service. They are strong and rugged—built to operate with safety and efficiency on the toughest jobs.

Outstanding features include manganese steel sheaves and manganese steel side plates, heavy duty anti-friction roller bearings, quick-opening "snatch block" construction and an extra wide throat. They may be equipped with safety swivel shackle, hook or shackle.

**WRITE FOR BULLETIN 130**

**TIME  
TESTED**

# **Alloy Steel and Metals Co.**

1862 East 55th Street

Los Angeles 11, California

**9 ORDERS IN 11 YEARS FOR**

**11**  
**HYDROSEAL**  
**PUMPS**

**From one of the out-  
standing Metal Mining  
Companies' in its field.**

NAME ON REQUEST

Another "Proof of Satisfaction" and this is only one of many concerns who have sent us repeat orders for quantities of Hydroseal Pumps. Hydrosealing saves  $\frac{1}{2}$  to  $\frac{1}{2}$  in power costs and with Maximix Rubber Pumping Parts, maintenance is reduced 4 to 6 times. Catalog No. 547 sent on request.

MARCH  
1937

MARCH  
1945

APRIL  
1945

SEPTEMBER  
1945

JANUARY  
1946

FEBRUARY  
1947

FEBRUARY  
1947

FEBRUARY  
1948

FEBRUARY  
1948

MARCH  
1948

APRIL  
1948

HYDROSEAL, PACKLESS AND MAXIMIX DESIGNS ARE COVERED BY PATENTS  
AND APPLICATIONS IN THE MAJOR MINING CENTERS OF THE WORLD

Correspondence from United States and Canada to  
**ALLEN-SHERMAN-HOFF CO., 221 S. 15th St., Phila. 2, Pa.**

Correspondence from anywhere else in the World to  
**A-S-H EXPORT CO., 221 S. 15th St., Phila. 2, Pa.**  
CABLE ADDRESS: ASH, PHILADELPHIA—BENTLEY'S CODE

# Performance-Proven



# POWER PLANTS

International Diesels are *performance-proven*. They have given remarkably dependable and economical service as the engines in International Diesel Crawler tractors. There just isn't any rougher work for an engine. Heavy loads, tough working conditions and long hours of operation all combine to give a crawler tractor engine a real going over.

Make no mistake about it. International Diesels are *performance proven*. You can be sure that you get full measure of profit-producing power from any International Diesel you select.

See your International Industrial Power Distributor or Dealer about your power requirements. He handles the full line of International Diesel and gasoline power units listed at the right.

He will be glad to help you select the right International Power Unit for your specific requirements. And you'll get the benefit of profit-producing power.

## INTERNATIONAL HARVESTER COMPANY

180 N. Michigan Avenue, Chicago 1, Illinois

Listen to James Melton on "Harvest of Stars" every Wednesday evening—CBS

**INTERNATIONAL ENGINES** are available as complete power units in the following models:

**DIESEL:** UD-24.....180 h.p. @ 1375 r.p.m.  
UD-18A.....125 h.p. @ 1600 r.p.m.  
UD-16.....100 h.p. @ 1800 r.p.m.  
UD-14A.....76 h.p. @ 1400 r.p.m.  
UD-9.....53 h.p. @ 1500 r.p.m.  
UD-6.....39 h.p. @ 1500 r.p.m.

**GASOLINE:** U-9.....55 h.p. @ 1500 r.p.m.  
U-6.....41 h.p. @ 1500 r.p.m.  
U-4.....31½ h.p. @ 1800 r.p.m.  
U-2.....22 h.p. @ 1800 r.p.m.

Write for informative catalogs on International Power Units:

Form **A-54-LL**  
INTERNATIONAL ENGINES  
AND POWER UNITS  
Gas, Gasoline or Distillate

Form **A-251-LL**  
INTERNATIONAL DIESEL ENGINES  
AND POWER UNITS



# INTERNATIONAL

**CRAWLER TRACTORS  
WHEEL TRACTORS  
DIESEL ENGINES  
POWER UNITS**

MINING WORLD, published monthly except in April when publication is semi-monthly, by American Trade Journals, Inc., 121 Second Street, San Francisco 5, California. Entered as second class matter at the post office at San Francisco, California, under Act of March 3, 1879.

## HOW BUCYRUS-ERIE BLAST HOLE DRILLS CAN SAVE YOU MONEY

**More Footage  
Per Shift**



There's no secret behind the greater drilling footage provided by Bucyrus-Erie blast hole drills throughout each shift. Take a look at the story:

**1. Fast, Steady Drilling Motion.** Accurately timed drilling action produces more effective blows per minute . . . permits tools to strike with maximum force. Stroke length may be varied to fit the formation.

**2. Rapid Penetration** results largely from a derrick-head rubber shock absorber that gives the tools extra reach, then instantly snaps them back the moment the blow is struck. With maximum penetrating power thus concentrated on the hole bottom, faster rock preparation is assured.

**3. Properly Fitted Tool Weights,** with weights determined by the type of job to be handled, also help insure shattering drilling blows for more footage per shift at less cost per foot. Each model Bucyrus-Erie rig has ample capacity to do the most effective drilling job in its size range.

**BUCYRUS  
ERIE**

SOUTH MILWAUKEE, WISCONSIN

It will pay you to check these Bucyrus-Erie blast hole drills when you plan your new equipment purchases:

22-T 5 3/8"	to 6 3/8" holes
27-T 6"	to 6 3/8" holes
29-T 6"	to 9" holes
42-T 9"	to 12" holes

Gasoline or electric power is available for all machines, diesel for all except the 22-T.

22-049



# THE BEGINNING OF A LASTING FRIENDSHIP



Nothing makes a bigger hit with runners than equipment that combines easier handling with fast, positive action. Make sure they get it — and they'll cut costs for you on every shift!

Take this new Blue Brute Stoper, for example — the self-rotating WR-31. Note how the holding handle is placed *above* the center of gravity, for better balance. Then, there's the shielded, down-directed exhaust . . . and the constant air stream that keeps sludge and water out of the shielded chuck . . . additional features that get a runner's enthusiastic OK!

Built throughout for continuous heavy duty, the WR-31 is packed with

design improvements. Like the ratcheted rifle bar's engagement of four air-operated pawls on the piston's backstroke . . . a typical Worthington "exclusive" for fast, trouble-free drilling.

Let an on-the-job demonstration prove to you that *there's more worth in a Blue Brute*. Get your runners' verdict on the WR-31's ease of handling . . . and see for yourself how much cleaner and faster they can cut away footage.

*Write for literature describing the complete line of BLUE BRUTE Mining Equipment, including Drifters, Stoppers and Hand-Held Drills.*

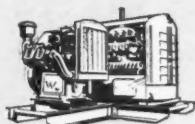
HR-19



## BLUE BRUTE DRIFTERS

Types WPM (Pneu-Motor incorporated in Drifter), WPMS (Pneu-Motor on Shell), and WHC (Hand Crank). Featuring the new, *balanced* design for faster drilling cycles and all-around operating economy.

## BUY BLUE BRUTES



Semi-Portable Compressors. Drifters with Feed Motor Incorporated. Drifters with Feed Motor on Shell. Hand-Crank Drifters. Stoppers. Hand-Held Rock Drills.

## WORTHINGTON



Worthington Pump and Machinery Corporation, Worthington-Ransome Construction Equipment Division, Holyoke, Mass.

Distributors in all principal cities

# No Removable Rock Bit Is Better Than Its *UNION*

The Timken union with one-piece, solid steel shoulder construction is one of the important reasons for the outstanding performance of Timken Rock Bits through 14 years of successful service in mines, quarries and on construction projects of all kinds.

Here is a union that saves the bit and steel threads by taking the drill impact on the broad, flat machined shoulder of the steel; *a union with only a single joint.*

Here is a shoulder construction that is a single, solid piece of steel — nothing to loosen up under the constant shock of the hammer blows no matter how hard the rock may be.

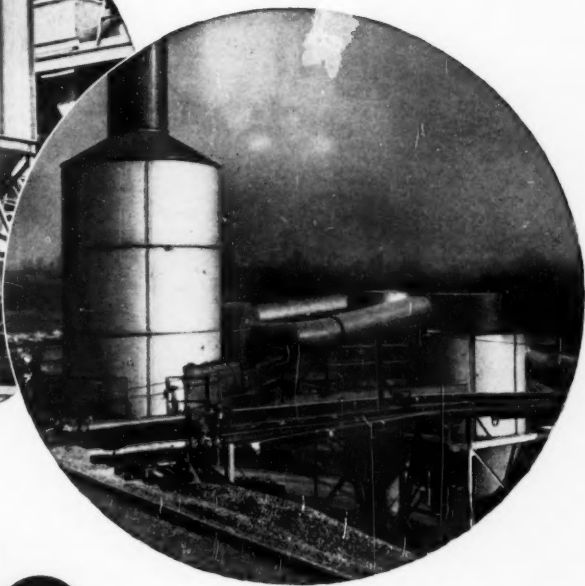
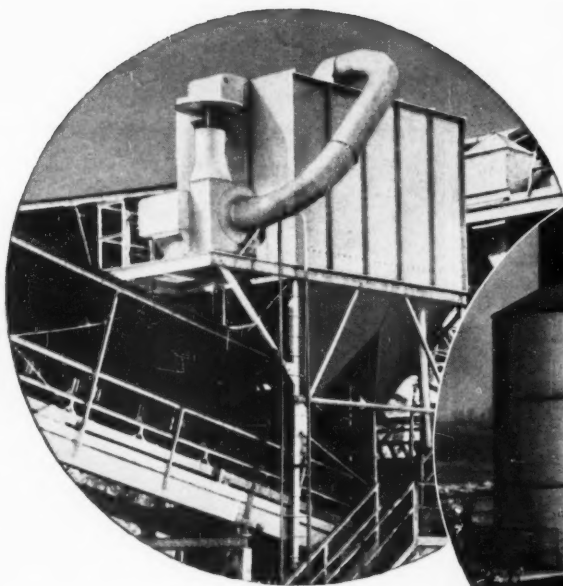
Furthermore, by distributing the hammer blows evenly over the cutting edges of the bit, the Timken shoulder construction increases drilling speed and enables the bit to retain its gauge to the limit of its useful life.

These advantages will enable the special attributes of Timken Carbide Insert Bits to be exploited to the very maximum of speed, endurance and economy.

**THE TIMKEN ROLLER BEARING COMPANY**  
CANTON 6, OHIO • CABLE ADDRESS "TIMROSCO"



**TIMKEN**  
TRADE MARK REG. U. S. PAT. OFF.  
**ROCK BITS**



# Norblo

## Dust and Fume Collection Systems

Shown above are the automatic bag type, the hydraulic (washer) and the centrifugal (cyclone) types included in Norblo equipment. Most heavy duty large scale Norblo installations in the mining, smelting and chemical fields include two types in combination. Norblo engineers have wide experience in designing and fabricating highly efficient dust and fume collection systems in all of the industries in which dust and fume collection is of major production or good housekeeping importance. Write for bulletins — or tell us the general nature of your problem.

**THE NORTHERN BLOWER COMPANY**

6420 BARBERTON AVENUE

•

CLEVELAND 2, OHIO

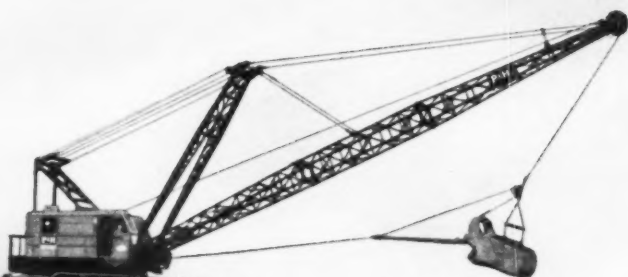
JANUARY, 1949

5

LOOK TO

**P&H**

FOR ADDED VALUES

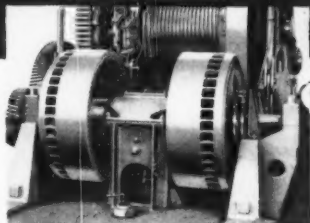


## **THE SWING'S THE THING!**

And here's the kind of swing that's sweet music to production men on steady digging. It's the Magnetorque on P&H 1055 that transmits power for swinging—without mechanical contact—without wear—without time lost for clutch adjustments—without the high cost of lining replacements.

There's nothing to compare with the P&H Magnetorque swing—with its smooth, velvety action—with its simple construction.

If you haven't seen the 1055 in action, write us. We will gladly tell you where the nearest machine is located.



THE P&H MAGNETORQUE transmits power for swing electro-magnetically—replaces swing frictions—eliminates the maintenance and repair work that goes with them. The Magnetorque unit will last the life of the machine.

**P&H**

**EXCAVATOR**

4572 W. National Ave.  
Milwaukee 24, Wis.

**HARNISCHFEGER**

THE COMPANY SINCE 1911



# MINING WORLD

with which is combined  
THE MINING JOURNAL

## A Miller Freeman Publication

Published monthly except in April when publication is semi-monthly

### JANUARY, 1949

VOL. 11 No. 1

### SAMPLE LOCATIONS

Capitol Concentrates .....	14
Northwest Mining Convention .....	16
Marysville: Northern Diggings Base .....	19
INTERNATIONAL SECTION	
International Panorama .....	29
Oil Shale Mining .....	32
Pend Oreille—The Northwest's Newest Large Development .....	35
Dredging, an Evolving Art—by Herbert A. Sawin .....	37
Important Find of Book Mica in Central Australia—by John Loughlin .....	40
Rhodesia Advances Gold Price—by "Miniscus" .....	42
Prominent Men in International Mining .....	45
International News .....	46

#### PUBLISHING OFFICE

San Francisco 5, Calif. .... 121 Second Street  
GARfield 1-5887

#### BRANCH OFFICES

Seattle 4, Wash. .... 71 Columbia St., MAin 1628  
Los Angeles 13, Calif. .... 124 W. Fourth St., MUtual 8196  
Vancouver, B. C. .... Royal Bank Bldg., MArine 1520  
New York 17 .... 370 Lexington Ave., MUrray-Hill 3-9285  
Chicago .... 4556 N. Paulina, SUunyside 4-6558

GENERAL MANAGER, San Francisco, M. F. HOLSINGER  
EDITOR, San Francisco, JOHN B. DORSH  
ASSOCIATE EDITOR, Vancouver, CHARLES L. SHAW  
NORTHWEST MANAGER, MILLER FREEMAN, JR.  
PRODUCTION MANAGER, E. B. HERINGTON  
EASTERN MANAGER, KAREL WEGKAMP

Published by  
AMERICAN TRADE JOURNALS, INC.  
MILLER FREEMAN, President  
L. K. SMITH, Vice-President  
W. B. FREEMAN, Publisher



Copyright 1949 by American Trade  
Journals, Inc.  
Contents may not be reproduced  
without permission.

#### SUBSCRIPTION RATES

U. S., North, South and Central American Countries .....	\$3.00
Other Countries .....	\$4.00
Single Copies .....	\$0.35
Directory Number .....	\$2.00

## Copper Allocation Foreseen

A combination of circumstances gives credence to the belief that, unless a marked improvement in supply occurs within a short time, allocation of copper will become a fact.

The principal factors adding up to this possible happening are short supply, unprecedented demand, the largest mine in the United States strike-bound, thus withdrawing indefinitely about 30 percent of the country's new supply of copper, and the need of laying up a store of metal for military emergency.

Prior to World War II the United States was a copper exporting nation. The reverse is true today; since then the United States has become one of the greatest importing nations of copper. The domestic consumption of copper in 1947 was more than double that of the average of the five-year period 1935-1939.

The Economic Co-operation Administration has disclosed that in the six months' period ending September 20, 1948, 121,593 tons of copper was authorized for procurement by European nations, and of this quantity 25,000 tons was to be procured from the United States.

In April, 1947, the United States Government took cognizance of the situation to the extent of lifting the four cents per pound import tax on copper until March 31, 1949. In connection with the recessing of this tax, the majority of the industry's spokesmen indicate that in their opinion the recess should remain for a longer time.

Copper is selling currently at 23½ cents per pound. To show how critical the situation has become, a black market is operating in copper and, in this connection, it is more than rumor in the industry that this market is offering 26 cents per pound for an undisclosed tonnage of copper for late December delivery.

One way to increase copper production, however distasteful it may be to the administration, would be to reinstate premiums to the marginal producers. The subsidy, according to one authority, would be of the order of 12 cents per pound, about equal to the size of the subsidy paid during the war for marginal copper. The same source estimates that copper production would be increased about 20 percent. MINING WORLD doubts that the increase would be as great, considering the number of deposits of workable grade that could be brought into production within a year, but the money would be well spent and the metal won would more than make up for the 10,000 tons divulged as the possible tonnage to be withdrawn by the Government if allocations enter the picture.

## Not for the Military Only

Screws made minor headlines during late November when it was announced that the United States, Canada, and the United Kingdom had signed an agreement providing for the "unification of the American and British standard systems of screw threads." On the face of the information the agreement has little significance, but in it lies one of the greatest possibilities of our time in so far as the beginning of the standardization of other things such as weights and measures.

Certainly the high tariff men will cry havoc, but the standardization may disguise a greater blessing as the limitations on exchange of goods assembled and held together by screws, bolts, nuts, and rivets should be lessened considerably as the unified standards infiltrate into general use.

Primarily it is understood that the standardization will be employed by the armed services of the three signatory nations, retooling of dies and other machines manufacturing the standardized items to begin immediately. Consider the impending mutual defense pact between the United States, Britain, France, and the Benelux nations, this in a small way wipes out the battle losses of World War II as the study among the three governments began nearly 30 years ago. In case of another war precipitated by an attack on any of the signers of the mutual defense pact, reconditioning of arms and other materiel of war will be speedily accomplished by a message to the nearest

# No More "Dry Runs"

## New Gardner-Denver Automatic Line Oiler Safeguards Rock Drill Lubrication



Here's positive protection against running rock drills without adequate lubrication. When all the oil in the new Gardner-Denver L012 Automatic Line Oiler has been used, air in the line automatically shuts off. Consequently, *there is absolutely no chance for drills to run when dry.* A carefully metered flow of atomized oil assures smoother lubrication with lower oil consumption—increases the operating efficiency of all air actuated equipment. Here are other valuable L012 features:

**OPERATES IN ANY POSITION**—L012 Line Oiler operates equally well in any position, either vertically or horizontally.

**USED WITH A WIDE RANGE OF TOOLS**—L012 will lubricate any pneumatic equipment using from 25 to 500 cubic feet of air per minute.

**EASY TO REFILL**—it is not necessary to shut off live air in order to refill the L012 Line Oiler.

For complete information, write Gardner-Denver Company, Quincy, Illinois

## GARDNER-DENVER

Since 1859



depot for repair or replacement parts, regardless of the country of origin of the equipment.

The military establishments of the three signatory governments are in their hands the opportunity to inject live counter-propaganda in the news as to how successful the standardization is working out that will do much to lay the psychological barrier imposed by the non-availability of parts on purchases of machinery among the various nations concerned. Trade and interchange of machinery will begin to increase at once as a result.

One argument that no high tariff man can refute is the fact that the United States became great by virtue of nearly 3,000,000 square miles of territory without a single customs or tariff barrier to restrict the free exchange of goods.

—J. B. D.

## DRIFTS AND CROSSCUTS

By Charles F. Willis

### Where Are We Going?

At the present time, the Bureau of Land Management has a number of its employees, principally from the district offices, in the field quizzing mining folks individually and personally and getting their ideas on certain changes in the mining laws that seem to be under consideration by the Bureau's top-ranking policy makers.

Of course, it must not be taken that every suggestion which is discussed is going to be placed before Congress in the form of new mining laws, but the subjects on which the mining men are being quizzed very definitely indicate the trend of thinking in the policy-making circles in Washington.

The whole quiz program is not being carried out in the same manner as government agencies generally go at such things. It is not being done by conferences and hearings, but on a person-to-person basis, and the one being interviewed does not have the advantage of hearing the arguments of others, and amplifying or expanding upon them. He leaves the interview wondering what is up. Yet the program is far more than mere changes and clarification. It is almost revolutionary.

The proposals being brought up for discussion by the Bureau of Land Management's representatives indicate that there is a strong wind blowing in the direction of:

1. What legislation can be enacted that will bring about a reversion to the public domain of the large number of mining claims which have been held for years, without really serious attempts at development, by performing only the minimum requirements of work, or accepting the assessment moratorium during the time that it has been offered?

2. What should be done to increase the requirements for holding mining claims located on the public domain, which will force a larger development and exploitation program and, in the event such a program is not carried out, cause those claims to revert to a public domain with reasonable promptness?

3. Should surface rights on mining claims be retained by those who are holding the claims for mineral purposes, or should the use of the surface be allowed by the government to others for other purposes and only permit the holders of the mining claims to utilize such a portion of the surface as is necessary to their work and to get even that privilege by application to a government agency?

4. Should we not completely abolish the present routine of locating and holding mining claims on the public domain and substitute therefor a renting or leasing system with the federal government in the role of landlord, collecting on a royalty basis?

5. What type of legislation should be enacted for the location and holding of mining claims where surface discovery, as required by the present laws, is not possible because of loose or solid overburden? Should there be any change in the current program when, as and if



## ASK YOUR PIPE CLEANING HEADQUARTERS FIRST!

We can help you save money by keeping your pipe lines clean and tops in operating efficiency. We have all the tools, mobile equipment and experience necessary to do this work for you at costs so reasonable they will astound you.

Mine operators and others have learned to ask their FLEXIBLE PIPE CLEANING DIVISION FIRST before planning "boil-outs," costly "dig-ups" and replacements and other service interruptions. They also know that FLEXIBLE is equipped for emergencies, night or day, and will go anywhere.

Call or write George Ellis right now for a work estimate on your particular pipe cleaning problems. No obligation involved.

## FLEXIBLE SEWER-ROD EQUIPMENT CO. PIPE CLEANING DIVISION (Los Angeles)

WRITE: P. O. Box 167 • Los Nietos, California  
Phone: WH 4-4108

## GOODALL "INFERNO" STEAM HOSE

\*Leading construction firms specify "INFERNO" STEAM HOSE because it's Stronger, Safer, More Flexible

Powerfully constructed with tightly braided layers of steel wire imbedded in a heat-resistant carcass, Inferno lasts longer, under high pressure.

In case of damage to hose, special construction diffuses steam, preventing a violent burst as steam escapes—a real safety factor.

Goodall design provides exceptional flexibility to withstand strain and constant flexing in pile driver services. Available in sizes ½" to 2½" I.D.

Be sure your next steam hose is the best,  
Goodall "INFERNO"!



Note the tough braided steel construction.

\*Raymond Concrete Pile Co. has specified Goodall Steam Hose for over 15 years.

**GOODALL RUBBER CO.**  
LOS ANGELES • SEATTLE  
• SALT LAKE CITY • SAN FRANCISCO

# HE'S NOT guessing...HE knows!

**"We've used 'Caterpillar' equipment for the past 25 years and know it does an excellent job."**

**Supt. W. G. EMMINGER,  
Nevada-Massachusetts Co., Tungsten, Nev.**



**T**WENTY-FIVE years is a long time—and in that time "Caterpillar" Diesel equipment has proved itself economical and versatile to the Nevada-Massachusetts Co., the largest tungsten mine in the U.S.A. It lists on its roster two D6 tractors (one with Traxcavator) . . . one Diesel Fifty . . . one D4 . . . two D4600 engines in shovels . . . and two veteran "Caterpillar" spark ignition tractors.

Here you see the D6 with the 1¾-yard Traxcavator bucket in action. It fills a 5-yard truck with

*A "Caterpillar" Diesel D6 Tractor sets a fast pace in the pit. Equipped with Traxcavator, it scoops up heavy tungsten ore and loads a 5-yard truck in 3 scoops in 3 minutes.*

the heavy ore in 3 scoops—in as little as 3 minutes.

Supt. Emminger adds: "This D6 with Traxcavator is doing a great job under tough conditions. Its mobility enables us to service many stockpiles. Its easy handling and good control make it easy on the operator."

**CATERPILLAR TRACTOR CO., San Leandro, Calif.; Peoria, Ill.**

## CATERPILLAR DIESEL

REG. U. S. PAT. OFF.

**ENGINES • TRACTORS  
MOTOR GRADERS  
EARTHMOVING EQUIPMENT**

**MINING WORLD**



discovery is ultimately made by exploration work in such cases?

6. Is the finding of mere mineral-bearing rock in place sufficient discovery, or should the regulations be tightened to require an ore deposit that might be "commercial" in the relatively near future?

7. Should the laws be so amended that relocation is impossible by a person who has failed to do his assessment work as required by the present law? Should there be a tax or rental payment substituted for assessment work?

8. Should the requirements for laying out and monumenting mining claims be made more specific and definite and should all persons be required to file in a common place, with a full and complete survey description, so that anyone seeking to learn if land is open for location can positively determine who has prior rights, and the extent of such rights?

It should not be stated positively that the Bureau of Land Management, or other federal agencies which handle public lands, is definitely aiming toward the goal indicated in the above line of thought. However, it does show what proposals are deemed necessary for investigation, and it also shows the direction in which the wind is blowing, and gives some indication of the force of the gale that is to come.

The Public Lands Committee of the National Minerals Advisory Council is steering its investigations along parallel lines, but with the idea of protecting the mining industry rather than inflicting new burdens upon it. It is going to require the utmost co-operation of the mining industry to see that no changes in the mining laws are made which will hamper development of our mineral resources.

The wind is blowing hard at the moment and it is up to those engaged in domestic mining to see to it that it is controlled and that it does not develop into a destructive hurricane.

### No One Group Did the Job

Some of the more prominent labor leaders are now claiming that the unions elected President Truman. According to them, the biggest single issue was the Taft-Hartley Act. That will take a good deal of proving to anyone who has made even a cursory examination of the final returns. Governor Dewey ran strongly in the industrial states, where the labor vote is proportionately largest, and carried most of them. The President, on the other hand, did extremely well in the agricultural regions, where organized labor amounts to but a small minority of the population.

Arizona provides the most interesting example. Truman carried it easily. Yet, at the same time, the voters approved by a large majority a measure outlawing the closed shop. That certainly doesn't look as if the people want labor to hold the whip-hand over the government or the people.

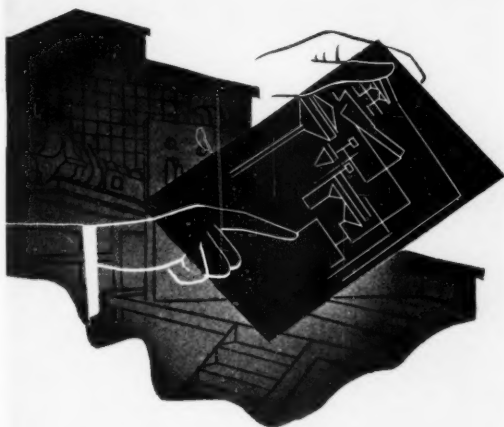
President Truman does not owe his remarkable success to any group or any class. He wasn't elected by labor or capital or agriculture, or any other segment of the nation. He was elected by the American people, and he is the President of all the people. He doesn't even owe allegiance to the Democratic leaders—most of them deserted him when they thought his cause was lost, and he won in spite of these unadmirable defections.

Harry S. Truman has a chance to go down in history as one of the great Presidents—as a man who, when the world was torn between slavery and freedom, stood staunchly for the liberties of mankind, and was too big to admit the allegiance to special interests of any kind. The whole civilized world hopes that he may measure up to the enormous responsibilities that have fallen upon him. He has a chance now to rise above group prejudice or group selfishness.

*Charles F. Millie*

JANUARY, 1949

CYANAMID SERVICE TO WESTERN MILLS — 3 OF A SERIES



## HEAVY-MEDIA SEPARATION

Heavy-Media Separation Processes offered by Cyanamid are now being used on a long list of metallic and non-metallic ores. Expanding uses have considerably increased the backlog of technical data on their applicability as preconcentration processes in conjunction with flotation and other recovery methods, as well as to make a finished concentrate on ores previously considered too low-grade for profitable treatment.

Cyanamid Mineral Dressing Laboratory facilities include a continuous Heavy-Media Separation pilot plant with commercial-size equipment to test carload samples under actual mill conditions. By arrangement through Cyanamid Field Engineers, the services of the Cyanamid Mineral Dressing Laboratory can be made available to work on your beneficiation problem. We invite your inquiry.

**AMERICAN CYANAMID COMPANY**

30 Rockefeller Plaza, New York 20, N. Y.

AZUSA, CALIFORNIA



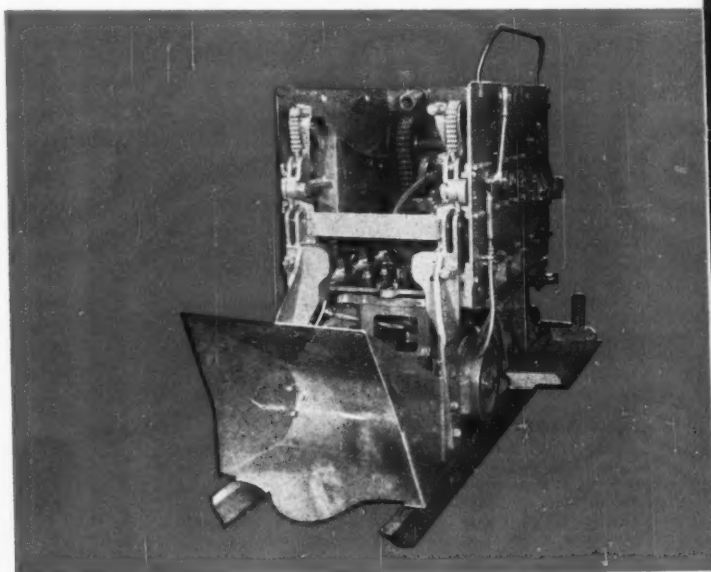
EL PASO, TEXAS

**"One of the best pieces  
of equipment on the job!"**

*That's what users say about*

# **JOY SHOVEL LOADERS**

---



*The JOY HL-20 Shovel Loader for large drifts. Can load up to 3 tons per minute using cars from 50 to 90 cu. feet capacity.*

*The JOY HL-3 Shovel Loader  
for small drifts. Can load up  
to 2 tons per minute.*



## *Note these Superior Features*

**They mean Lower Maintenance—Faster Loading at  
Less Cost—Greater Flexibility**

● automatic CENTERING DEVICE, an exclusive JOY feature. Quickly and easily adjusted to have centering take place at any point in the loading cycle. Makes loading under inclined walls easier, and gives a longer, straight throw back into the car.

● SUPERIOR CONSTRUCTION . . . truck frame, gear case, and bumper are all combined in one heavy alloy casting for perfect alignment of all parts.

● exclusive "PISTONAIR" MOTORS . . . give greater power for loading and tramping, and provide better air economy.

● a LUBRICATION SYSTEM that is simple, yet provides ample lubrication for all moving parts.

● adjustable ROCKER-ARM LEVERAGE, another exclusive JOY feature. By changing position of lifting chains, the loader can load either long or short cars by changing discharge speed of bucket.

*Consult a  
Joy Engineer*



WRITE FOR BULLETIN

W&D M2093

# JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING • PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO



## NEW ASSIGNMENTS LOOM FOR CONGRESSIONAL COMMITTEES DEALING WITH MINING

The political shift in the Senate and House will mean quite a few changes in committees which deal with mining. Although there are several possibilities in each case due to potential changes in assignments, Andrew L. Somers of New York is in line for the chairmanship of the all-important House Public Lands Committee.

Generally, this committee is composed of westerners interested in public lands problems. Somers, from Brooklyn, at one time was chairman of the House Mines and Mining, due to the seniority system. He can have no possible interest in anything west of Borough Hall. During his incumbency the mines and mining committee almost never met and only reported a couple of bills after a sort of revolt within the group stirred the gentleman up a bit. Such tactics would not do in such a committee as Public Lands, which has enough business to keep the chairman and a number of subcommittee chairmen busy all the time, much of which cannot be neglected. Perhaps the thought of so much work may induce Somers to take on a different committee.

Among several possibilities for chairman of the mining subcommittee of Public Lands, it seems as though Clair Engle of California, whose good work on the subcommittee has been so favorably received around the country, may get this post. Two other subcommittee members—and it is to be hoped they retain their places—are in line for other subcommittee chairmanships. These are Murdock of Arizona and Fernandez of New Mexico.

In the Senate, the mining subcommittee of Interior and Insular Affairs, headed during the 80th Congress by Dworshak of Idaho, might have as chairman Murray of Montana or O'Mahoney of Wyoming, both excellent choices. It is rumored that Senator Murray will make an effort to have the Senate Small Business Committee extended through the 81st Congress under his chairmanship and if so he may well be expected to increase the activities of his mining and minerals industry subcommittee, which did such exceptional service for small and marginal operators all through the war.

### ● *Straws in the Wind*

Due to the strike at Kennecott Copper Corporation, the production of copper from domestic mines is estimated to be down to 75,000 tons a month as against an estimated consumption of 117,000 tons a month. A little more marginal production

would come in real handy just now.

With the passage of S. 138, the Hayden mine loan bill—or its incorporation into the RFC Act as an amendment—and the resumption of incentive payments to marginal mines to enable them to keep ahead of galloping costs, this additional marginal production would be helping to relieve the situation. To those who say marginal copper production does not amount to much, we retort: "Every little bit helps—even Revere." Page Mr. Dallas.

Incidentally, it is understood that foreign copper is being offered in the domestic market at 4 cents above the established domestic prices. Does this indicate the answer to the question, what price tariff suspension?

### ● *Hold It to One or Two Years*

The strong tide to continue the copper tariff suspension probably cannot be stemmed at this time. But the suspension should be held down to one or two years. At best, these continued suspensions become a habit hard to break. Witness the assessment work moratorium.

### ● *Board Discusses Stockpiling*

The Munitions Board, through a "spokesman," reports that "very satisfactory" progress has been made in connection with the stockpiling program. At the same time, it is admitted that the demands have been "the very minimum."

No attempt is being made by the board or the Bureau of Federal Supply, which takes orders from the board, to help expand copper production by offering inducements to new mines or marginal mines. It is the old story of "we buy at the market," but we might offer some assurance of a "floor" if we can cut off at our own "ceiling." Producers who have offered high-cost copper to the board—and it is reported that a number have done so—are not encouraged by the attitude of the contracting officers at the Bureau of Federal Supply.

Those who know something about the difficulties ECA is having in trying to arrange for a flow of foreign metals and minerals to the United States are given a bit of wry amusement by the policy statement of the Munitions Board: "Stockpile policy and programming must take cognizance of substantial new sources of raw materials which may be made available from overseas under the program of the Economic Cooperation Administration." Another policy statement published by the

board is interesting in its obvious attempt to hold the door open for future policy changes. It says, "The policy of the board has been to buy materials for the stockpile at or below current market prices. However, in response to the increased need for certain scarce items to bring the stockpiles into balance, it may be necessary to have leeway from rigid adherence to this policy." This latter statement probably was written by Captain Caution.

### ● *Contract Copper, Lead, Zinc*

Copper, lead, and zinc producers have decided they prefer to arrange stockpiling allocations with the Bureau of Federal Supply on a company rather than an industry-wide basis, along the line of contracts, and not the voluntary allocations program proposed by the Commerce Department.

The American Metal Market reports that a lead stockpiling goal of 70,000 tons has been set for the fiscal period ending June 30, 1949, and that 19,000 tons already have been contracted for. Where the additional 51,000 tons is to come from is a mystery, if industry is not to suffer severely.

### ● *Data Sought on Steel*

At the meeting of the Mining Machinery Task Committee, called by the Office of Industry Cooperation of the Department of Commerce, a motion was made that the mining machinery industry "should proceed to furnish the necessary information requested by the Steel Products Advisory Committee in order that the proposed mining machinery program may be resubmitted to that committee at an early date" to determine the industry's steel requirements. It was recommended that the information be assembled by the American Mining Congress with the co-operation of the committee's consultants. The Mining Congress is urging a voluntary allocation program.

On the other hand, large quantities of steel products are being allocated by ECA to foreign countries, including the United Kingdom, and large quantities of foreign cars are being advertised for sale in the United States.

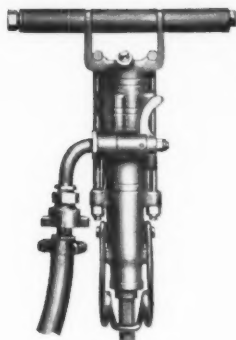
### ● *Possible Source of Manpower*

In the face of industry and stockpile requirements for increased metal production, the shortage of miners seemingly continues to be a real bottleneck. In sorting out displaced persons for prospective immigrants, a great deal of weight should be given to those with mining experience, according to experts in the manpower field.





CP Sinker Drill in operation at Benson Mines, Star Lake, N. Y.  
Photograph through courtesy of Jones & Laughlin Steel Corporation.



CP-22 Sinker Drill



CP-42 Sinker Drill

## There's a CP Sinker built for the job

For any type of sinker drilling, you'll find exactly the right equipment in the complete CP line of Sinker Drills, ranging from the light CP-22 to the heavy duty CP-60N.

For production work in soft to medium formations . . . block holing . . . lateral and overhead trimming . . . operating in restricted quarters — the CP-22 (30-pound class) is ideal. Perfectly balanced, it is easily operated by one man.

For shaft sinking . . . underhand stoping . . . general utility work in medium to hard formations — the CP-32 (45-pound class) is recommended. Its low air consumption adapts it for use with portable compressors.

Designed for shaft sinking in the harder formations . . . other heavy duty work — the CP-42 (55-pound class) has a longer stroke, although otherwise identical in design with the CP-32. Its powerful air blow keeps even the deeper holes free from cuttings. It can also be used on a board for horizontal drilling.

*Write for Bulletin 850.*



**CHICAGO PNEUMATIC  
TOOL COMPANY**

General Offices: 8 East 44th Street, New York 17, N. Y.

ELECTRIC TOOLS • AIR COMPRESSORS • PNEUMATIC TOOLS • DIESEL ENGINES  
ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES



Top row: Rowland King, re-elected president of the Northwest Mining Association, "... keep the public advised about the minerals industry..." C. Girard Davidson, Assistant Secretary of the Interior. "We should develop better conservation practices." Frank Marr, president, Spokane-Idaho Mining Company. He headed the resolutions committee. Paul B. Jessup, vice-president, Day Mines, Inc. He was chairman of the session devoted to mine taxation. A discussion of mine taxation was led by Maurice Cooper and Eustace LeMaster, certified public accountants. Bottom row: The Securities Exchange Commission was represented in part by these two men, James E. Newton and Day Karr, regional administrators. For the first time in 15 years the SEC failed to come under fire from the resolutions committee of the Northwest Mining Convention. Roger O. Oscarson, manager, Northwest Mining Association. A busy year for the organization was reported by him. The Montana School of Mines and Bunker Hill got together in the persons of Dr. Francis Thompson, president, Montana School of Mines, and C. Y. Garber, mill superintendent, Bunker Hill & Sullivan Mining and Concentrating Company.

## NORTHWEST MINERS CONSIDER GOVERNMENT ENCROACHMENT

Primarily, the 54th annual convention of the Northwest Mining Association brought into focus before more than 600 members and guests on December 3 and 4 the fact that the mining industry must seek unity within its ranks if it is to continue to operate under the free enterprise system. This was emphasized by Rowland King, president of the organization, in the opening address and brought out directly and by inference throughout the meeting.

Primary mine financing, mine taxation, wage and hour rulings, premium price payments, the munitions board stockpiling program, and last, but not least by any manner of speaking, the activities of the Bureau of Land Management, are matters calling for immediate attention and action, according to Mr. King.

### Watchfulness Necessary

He urged the members and visitors, as members of the one basic industry, to "take cognizance of the definite trend toward the varying forms of socialism, public ownership, government control and other devices, the principal objective of which is to take over our public utilities and eventually our natural resources." Furthermore, he warned that the forces opposing the free enterprise system are increasing steadily and the mining industry must present a united front in opposition to them if they are to be defeated.

"We should be making a concerted effort," said Mr. King, "to keep the

public advised about the mineral industry by presenting facts and combating the half-truths and misleading statements of those interested in breaking us down."

Mr. King admonished the industry to watch carefully the actions of state legislatures and Congress and urged the pooling of public relations resources upon the Pacific Northwest states, Alaska, Yukon Territory, and British Columbia through their mining associations with the object of clearing all such matters through one agency and thereby strengthening their mutual position.

### Tax Relief Proposed

C. Girard Davidson, assistant secretary, Department of the Interior, spoke at the second day's luncheon on the ambitious plans of the Department in the mineral field. According to Girard, the Interior Department will recommend the revision of the mining laws and tax relief for the industry if studies now under way indicate that such actions will expand production and said that the Department should inquire as to "the necessity for incentives, financial and otherwise, which will assist miners to find new deposits." He went on record calling for a national minerals recovery program and said that the Interior Department should have between \$50,000,000 and \$60,000,000 to begin the studies.

Furthermore, Girard pointed out, the Interior Department's present mineral activities operate on a \$30,-

000,000 budget yearly, a sum equal to only two-tenths of 1 percent of the budget for national defense and asked that this sum be compared to the \$12,500,000,000 value of the output of the minerals industry.

"We want to study exhaustively the effect of the present tax structure on minerals development," Mr. Girard said. "If it is true present practices do not give due allowance to the exhaustible nature of mineral deposits, if it is true they inhibit exploration, if it is true there is insufficient correlation between state and federal tax procedures, then we want to propose recommendations to remedy the situation."

The Department's Minerals Advisory Council of representatives from the industry is considering the problem and the Department desires to employ the necessary experts to carry studies to a successful conclusion.

### Archaic Mining Laws

"We are told that the present laws make discovery of hidden deposits almost impossible," continued Mr. Girard, "that they do not take into account new scientific methods of exploration and that they do not permit land tenure sufficient for satisfactory subsurface operation."

"We have a report from the Minerals Advisory Council on this problem also and we are going forward with our analysis to the extent our limited staff allows."

Stressing the need for an increased budget, Girard pointed out that "we would at long last move in on examination and revision of our archaic mining laws so that they would encourage the mining industry to develop minerals on public lands."

#### **Tariff Problems**

The Interior Department wants to study tariff problems as they affect mining, said Mr. Girard. "The dilemma created by the requirements of a healthy domestic minerals industry and healthy economic relations abroad to insure necessary minerals imports calls for a comprehensive re-examination of the tariff structure."

"We should like to maintain a continuous appraisal of where we stand in the minerals field so we always can look ahead to where we are likely to be short and thus be ready to initiate action to relieve the shortage."

"Such appraisal would provide the mining industry with the up-to-date information which we are unable to give in full now. . . ."

"We could do a much better job in research to improve exploratory methods and we could do a great deal faster with geologic mapping."

"We should develop better conservation practices. We should promote more intensive and efficient use of minerals. . . . We should be doing much more than we are doing today in finding substitutes to take the place of scarce minerals."

#### **Misleading Financial Reports**

Carl J. Trauerman, secretary, Mining Association of Montana, explained that the mining fraternity should make every effort to explain financial statements to the public. Said Mr. Trauerman: "Most formal corporation financial statements give out the idea that all net earnings are profits available for dividends. This is misleading, to say the least. The general public gets the idea that the corporation is charging too much for its products or services, labor gets the idea that it should receive higher wages, and our legislators are of the opinion that there should be a further increase in corporation taxes."

"The fact is that less than half the net earnings of our corporations are paid in dividends to their stockholders and more than half of the earnings are put back into plants, not necessarily for expansion, but for normal physical upkeep. . . ."

"A number of our corporations issue quite lengthy quarterly and annual pamphlet reports, in which they explain in detail (in the text of the report) why it is necessary to plow back over half of their earnings into the business. I believe that this explanation comes too late."

#### **Government Agencies Report**

S. H. Lorain, chief, Albany Division, Mining Branch, U. S. Bureau of Mines, Albany, Oregon, told how his bureau had assisted in the location of

mineral deposits in a progress report delivered during the convention.

The Bureau of Mines during the last decade has located minerals of a gross value of more than \$400,000,000 at 1947 prices, Lorain declared. Ore deposits of a value of \$290,000,000 are now under development.

Deposits that appear to be of a marginal nature sometimes develop into valuable orebodies, said Lorain. Two examples of this are the Black Bird cobalt-copper deposit at Forney, Idaho, now under development by the Howe Sound Company and the antimony operation at Stibnite, Idaho, where the Bradley Mining Company is constructing a \$1,250,000 antimony smelter.

At Albany, Oregon, the Bureau of Mines is conducting experiments that employ an electric reduction process that may be utilized in reducing the

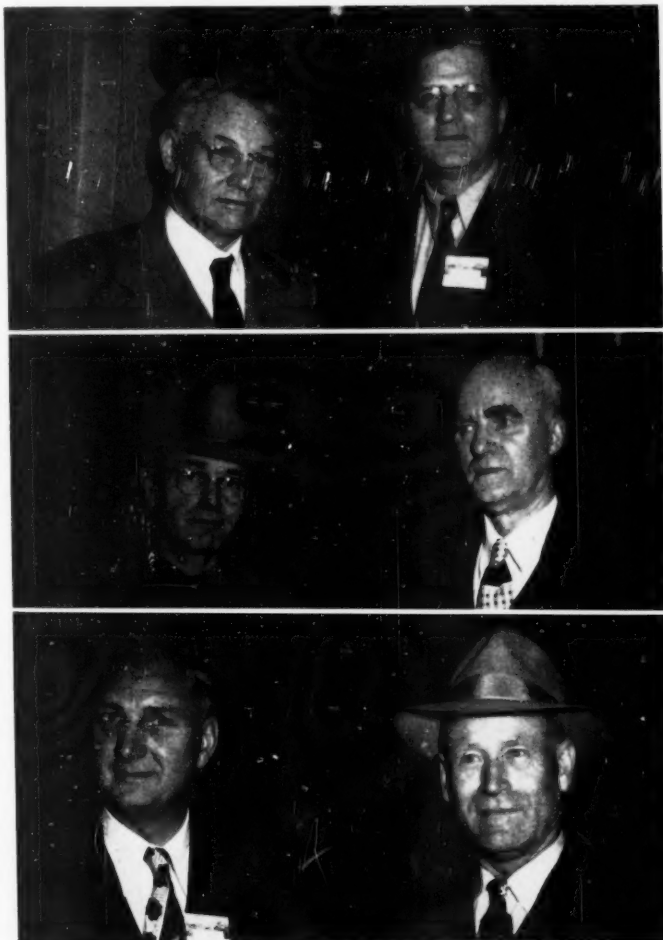
ore from a large nickel-iron deposit near Cle Elum, Washington. This orebody was explored during the war but could not be reduced economically by methods employed at that time.

Describing the production of metallic zirconium as the outstanding project of the Albany laboratory, Lorain said, "The laboratory is materially increasing its rate of production of zirconium."

"When the metal has been developed to the point of commercial production, a new metal industry will have been created, and the common mineral zircon will have become a valuable ore mineral."

A. E. Weissenborn, district engineer, U. S. Geological Survey, Spokane, Washington, described how the Geological Survey had played a large part in the mammoth phosphate de-

Matt Swanson, miner, and L. H. Moehring, vice president, Kaaba Silver Lead Mines, Inc. Harry W. Hargood, miner, and Lewie Williams, president, West Coast Mineral Association, interrupted during a discussion that pertained to the mineral development of the Northwest. N. K. Anderson, president, Alloy Steel & Metals Company, Los Angeles, and F. H. Mitchell, general manager, Highland-Surprise Consolidated Mining Company, Wallace, Idaho, caught by the MINING WORLD camera as they chatted between meetings.



velopments of southeastern Idaho. Also touched upon was the work performed in the Coeur d'Alenes, the Black Bird cobalt area of Idaho, the John Day region, the Klamath Mountains in Oregon, and mention was made of the work performed in the coal formations west of the Cascades.

The work in the Coeur d'Alenes has been concentrated along the easterly extension of the highly mineralized Silver Belt, extending from Wallace, Idaho, to the Montana boundary. Other projects in this district are in the upper Pine Creek and the Sunset Peak areas.

Mention was made of an air-borne magnetometer survey conducted by the U. S. Geologic Survey during the last summer. Owing to the rugged terrain and the high relief, new items were introduced into the readings and the results must be studied with more than ordinary care before conclusions are reached.

### More About Agencies—the SEC

In a prepared talk, "Functions of the Mining Unit of the Securities and Exchange Commission," Ellsworth Y. Daugherty, mining engineer, Securities and Exchange Commission, defended the recent actions of the SEC, saying that although opinions might differ regarding the workability of some of the earlier rulings no question exists about the intent of the law. The law was drafted with the view to require full and fair disclosure of the pertinent facts and to prevent fraud through misleading statements. This applies especially to the floating of mining ventures.

Nearly all new mining ventures at present come under SEC regulation A. This regulation restricts companies to raise capital to the extent of \$300,000 in a twelve-month period. Under regulation AM a prospectus is required, which is not the case with regulation A, and as the regulation applies only to assessable companies the stipulation is that the limitation be set at \$100,000 to be expended in twelve months.

Of the filings made under exemption rulings, 105 were executed in 1945, 194 in 1946, and 236 in 1947. Forty-five percent of these, or 236 of those made in the three-year period, were filed through the Seattle office of the SEC. During these three years, companies filed to raise \$56,000,000 by full registration and \$55,000,000 by the exemption rules, thus indicating that half of the common stock financing was by small concerns.

As presented by Mr. Daugherty, the inference was that few, if any, of the original prospectuses stand a chance of passing the SEC's skirmish lines without a revision, no matter how carefully they might be written. "Regulation A is liberal to a fault," said Daugherty, "for some of the prospectuses and sales literature offered are seriously misleading. Some representations smell to high heaven.

Few original prospectuses present the unvarnished truth."

To exercise wide discretion and good judgment in deciding what statements in prospectuses and sales literature are misleading and false requires proper selection of the SEC staff, asserted Daugherty. Nobody who has seen the misrepresentations in the records of the Seattle office files can doubt that an agency for the protection of the public is a necessity. Daugherty insisted that the office does not attempt to determine the economic soundness or unsoundness of new mining companies, but whether the essential facts are truly stated.

Strange as it may seem, for the first time in fifteen years the resolutions committee of the Northwest Mining Association made no reference to the SEC, reputedly hostile to the floating of new mining capital.

### Mine Taxation and Patents

In a discussion of "Mine Taxation" by Maurice Cooper and Eustace LeMaster, certified public accountants, Spokane, Washington, it was reiterated that mining is a one-crop industry and that the proper approach to one phase of the problem is through a revision of the percentage depletion regulation which provides for 15 percent for the mining industry as against 27.5 percent for the petroleum industry.

A lively discussion took place during the last afternoon session under the chairmanship of E. C. Stephens, mining geologist Anaconda Copper Mining Company, Spokane, Washington on "The Need for Changes in the Law and Procedure Regulating the Patenting of Mining Claims."

The bone of contention was the letter written to Donald H. McLaughlin, president, Homestake Mining Company, by the director of the Bureau of Land Management, Marion Clawson.

Many men spoke their minds regarding the six points embodied in the letter, the consensus being that the points were drafted by someone not familiar with the mining industry. Especially pungent were the remarks made about point No. 3, which referred to "the right to graze . . . burros . . . on the claim . . ." as nearly everyone today has a "tin Lizzie" of some sort as a means of transportation and the burro is nearly as extinct as the dodo.

### Entertainment

Again the suppliers of the industry set a feast before the guests such as the old Romans never imagined and again a cocktail party was served that set a mark for other parties to shoot at for a long time to come. The music was smooth, the company excellent, and the party ended all too soon.

The Sourdough breakfast was sold out and Carl Trauerman did a commendable job as master of cere-

monies. Many were the stories told and the breakfast ended all too soon.

At the closing dinner Edward P. Ryan of Spokane was toastmaster, an office he has discharged for several years and which he seems to improve upon each succeeding year. Other entertainment was had in the songs of Phil Crosbie and the piano duets of Dr. and Mrs. Hans Moldenhauer.

### Brief of Resolutions

Under the chairmanship of Frank N. Marr, president, Spokane-Idaho Mining Company, the resolutions committee came up with some sound ideas. Among these were the opposition to the creation of valley authorities, endorsing a bimetallic currency with the free circulation of gold and silver, advocating protective tariffs, urging the construction of roads into mining districts, and strongly favoring the opening of lands on the public domain to private entry.

Other resolutions called for support of plans of the U. S. Bureau of Mines for a division in the Pacific Northwest and an experiment station in the Spokane area, the permanent solution of administration of mining laws, suggested caution in the extension of reciprocal trade agreements, cited unwise taxation as one of the principal deterrents to mine financing, and recommended the deferment of treatment of government-owned zinc.

### Petroleum in Quantity

"Facts vs. Fallacies in the Petroleum Industry, with Remarks on Some Popular Misconceptions Regarding the American Oil Industry," by Fielding McClaine, dispelled some of the doubt from the public mind regarding the petroleum resources of the United States.

According to Mr. McClaine, the various government agencies contribute to the belief that petroleum reserves are nearing exhaustion in the United States. Oil output increases steadily according to the following figures:

1947	5,035,000 bbls.
Today	5,580,000 bbls.
By Mid-1949	5,700,000 bbls.
	(estimated)
By end of 1949	5,800,000 bbls.
	(estimated)

As to reserves, on January 1, 1948, it was estimated that the United States had a total of over 21,000,000,000 bbls. of petroleum proved. Available now by improved secondary recovery techniques from old and abandoned fields is 20,000,000,000 bbls., and the tide lands of the Gulf of Mexico and California have reserves that seem assured to the extent of the proved reserves. Moreover, the oil shale reserves of Colorado, Utah, and Wyoming have an estimated reserve of 300,000,000,000 bbls. In summing up, Mr. MacFarland declared, "The United States is not running out of oil. It has the larger proved reserves than ever before in history."



## MARYSVILLE: NORTHERN DIGGINGS' BASE

In the early days of the Gold Rush, Sacramento was the supply center for all the mines. Soon, however, the eager prospectors fanned farther out into the mountains, exploring every river and stream, and it became necessary to set up more advanced bases of supply. These were Jackson and Stockton for the Southern Mines, and—for the Northern Diggings—Marysville, on the Yuba River.

The Yuba and Feather river region was first explored by the famous trader-trapper, Jedediah Smith, in 1828. The second recorded visitor was Captain John Sutter, who journeyed north a few years later to survey his vast but somewhat vaguely defined holdings. In 1842, Sutter sold this portion of his land to his German compatriots, Charles Flügge and Theodor Cordua, who became the first settlers on the Yuba River.

Almost immediately, Flügge grew discouraged and broke up the partnership, but Cordua proceeded to set up a semi-feudal state which he called Neu Mecklenburg, with the native Indians as his subjects. While developing a market for his crops, this far-seeing, former international merchant planned to take full advantage of the fact that his estate was connected to San Francisco by navigable rivers. He started the ambitious project of building ships, which he would fill with produce and sail to Mazatlan in Mexico, where both vessels and cargo would be sold, and in 1848 he announced a monthly packet service between New Mecklenburg and San Francisco.

But his great plans, like those of Captain Sutter, were wrecked by the discovery of gold. Workmen and retainers deserted, property was stolen, and Cordua was almost ruined by the hordes who took advantage of his open-handed hospitality. He took a partner, a Frenchman named Charles Covillaud, and finally, in desperation, sold out his holdings and returned to Germany.

Gold was discovered on the Yuba River in the summer of 1848. By September, 1849, hundreds of prospectors had passed by the junction of the Yuba and Feather rivers—the site of New Mecklenburg—on their way to the diggings. Covillaud decided that a town was needed to maintain direct boat connection with Sacramento and San Francisco, and that this was the logical place for it, so he incorporated

and sold lots. While the bidding was going on, a young New York lawyer, Stephen Field, arrived with only \$20 in his pocket. He was invited to join in the fun, and bid for lots to the value of almost \$20,000. This was so impressive that three days later, in a hotly contested election, he was made *alcalde*, beating out an "old inhabitant" who had arrived two days before him.

The new town was named Marysville, after Covillaud's wife, a survivor of the Donner Party, and a French surveyor was employed to lay it out according to the European plan of broad avenues and spacious squares. A gambling house was erected, known as the Round Tent because it was nothing more than a circle of willow stakes, roofed over with canvas, and Marysville was ready for business.

Marysville had to fight for its position on the river, however. From the day in 1848, when a man built a canoe and sailed down the Yuba to the Feather, down the Feather to the Sacramento, and on to San Francisco, carrying with him a barrel of corned beef as a gift to a friend, every town vied for its share of river traffic. It was not until the summer of 1849 that favor shifted to Marysville. This oc-

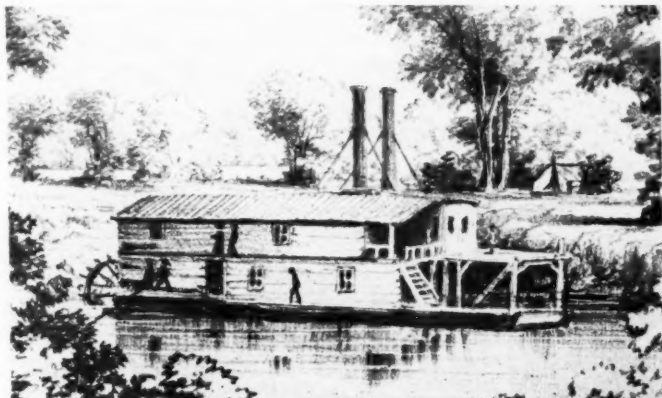
curred when a group of men brought from New York a small scow with a steam engine and stern wheel, the famous *Linda*, first steam vessel to sail up the Feather and Yuba rivers. Soon the steamers *Lawrence* and *Linda* were making weekly trips to San Francisco and back, and Marysville became the acknowledged queen of the upper rivers.

At Marysville, the boats were met by pack mules and wagon trains, which transshipped goods and supplies to the mountains. At one time, 4,000 mules and 400 wagons were owned in the town. The fare to San Francisco was \$35, although during a price war it once dropped to \$5.00, then \$2.50, and finally several steamers carried passengers for nothing.

The success of Marysville caused a veritable orgy of incorporation along the river, with towns springing up in every likely spot, although the majority had only a brief and unhappy existence. Marysville received its greatest fright during the dry summer of 1850, when the rivers fell so low that steamers no longer could navigate that far north. Beaten rivals for river supremacy took new heart, and Marysville resorted to sailboats, with as many as 24 docked at one time at the town wharf. The fall rains saved

The first dredge to operate in California, the converted river boat *Phoenix*, which was equipped with a "Bogardus Patent Amalgamator" and sank on its trial run. Later refloated, about \$100 in gold was recovered but this early attempt at dredging was abandoned in favor of the more lucrative newly opened lode mines. Picture made about 1850.

California Historical Society Picture





**This is how P&H Hartop  
hard-surfacing electrodes cut equipment  
downtime, raise man-hour production,  
reduce maintenance costs**

Here's an idler that is being hard-surfaced with P&H Hartop so that a tractor can get back to work in a hurry. The cost of doing this particular job is only \$25.96, counting both labor and electrodes.

And that's the beauty of Hartop. It helps you make repairs quickly and easily. You don't have to wait for repair parts. Your machinery stays on the job longer. Your man-hour production is greater. You see, worn parts hard-surfaced with these easy-to-use electrodes outwear new parts 2 to 3 times. That is why you get more work done and your costs are lower.

The Hartop series consists of four types of electrodes — with Rockwell C hardness ratings as follows: Hartop Brown, 35 to 40. Hartop Green, 45 to 50. Hartop Red, 50 to 55. Hartop Yellow, 58 to 63.

Maintain and repair with Hartop. \$4.25 buys you our trial package of all 4 types of these money-saving electrodes. Get a few packages today from your P&H distributor. Or write us for prompt delivery.



the day, however, and from then on river traffic continued unabated until, in 1874, silt from the hydraulic mines began to fill up the streams.

By 1850, the town's seven hotels were so crowded that guests were put up three and four in a room. A minister arrived from the East, took a look around, and became a monte dealer, informing friends that he had "found a better thing." Stephen Field, the alcalde, discovered, when he came to sentence the first culprit brought before him, that Marysville had no jail. A whipping post was erected, and for a time Marysville justice was dealt out to the tune of twenty-five or fifty lashes. It was notable that after receiving this punishment, the victim invariably left town for good.

Several kilns were set up, and so many of the houses were built of brick that Marysville received the title of "City of Bricks." Barrels of imported lime juice were set up in the saloons to help ward off the ever-present scurvy. Stephen Masset, the famous minstrel and song writer, for a brief time was co-editor of the Marysville Herald, writing under the name of Jeems Pipes, and the bandits, Tom Bell and Black Bart, operated in the vicinity. Disaster struck first, in 1851, when the combination of a sleepy Chinese laundryman, a bundle of clothing and a burning candle combined to burn down a large part of town, and, later, spring floods became an ever-present danger.

Marysville itself never produced much gold, although in 1851 it was necessary to pass an ordinance forbidding mining in the city streets, but Yuba County, as a whole, has been one of California's greatest gold-producing areas. In 1850, Marysville banks shipped out \$16,000,000—and although after 1851 agriculture equalled mining as an industry, the yield in 1857 still amounted to \$10,750,000.

Back in 1850, a small river boat, the Phoenix, had been fitted out as a dredge, even including a "Bogardus Patent Amalgamator" for catching the gold with quicksilver. On its first trial, the Phoenix struck a snag and had to be refloated, but early in 1851 it managed to take out around \$100 at a spot some nine miles above Marysville. Excitement ran high, stock was sold, but eventually dredging was abandoned as offering fewer rewards than the newly developed lode mining.

Years later, in 1898, the first dredge built in California was constructed on the Yuba River, digging 60' below the surface. By 1900, dredging had commenced in earnest, and the largest gold dredge in the world was built for the Yuba Consolidated Gold Fields, a dredge costing \$750,000 and capable of digging 174', a depth equal to a 14-story building. Since the start of operations in 1900, the Yuba gold dredging fields have been called the greatest in the world, with a yield approaching \$100,000,000.

**MINING WORLD**

## NO HOUSE CLEANING

There is no need that we should catalogue our troubles and woes, for we are beset on all sides by power-hungry executive departments and bureaus. We are reminded of the old fable of the cobbler and the camel. Like him, we are being so crowded and pushed that soon there will be no room for the miner in his own house.

That the above should be true is passing strange when we consider mining in its place as the real, primary, and most necessary industry. We supply more than 50% of all the pay freights on the railways. There is not a single industry or commercial enterprise that can even start operation until the miner supplies the material with which to work. Even agriculture would be following in the direct footsteps of Father Adam as he stirred the ground with a crooked stick on that first farm just outside the fence of the Garden of Eden. In the seventh generation of Man the first miner placed tools of iron in the hands of the farmer, and started him on his upward road. The miner has had a hand in every other improvement since then.


Why does the mining industry stand thus alone? It is because of our pride in our rugged individualism that does not plan nor ask for help. We do not even help ourselves, but leave the fight to John, or Charles, or Robert, or Bill. The executives of the greater mines meet in solemn (?) convention to listen to sonorous speeches and pass verbose resolutions. They then go home and forget public relations. Instead of acting to show the mutuality of interest between labor and management, opportunities are frittered away until the loyalty of supervising foremen is lost—their last representatives below ground. The mining industry should wake up before it is too late. Socialism and communism are on the march.

In one of the first announcements made by the President since election, it was stated that there would be no house cleaning in Washington. This means that the whole "have not" tribe and the fellow travelers will continue to torment us. It has been suggested that Secretary Marshall wishes to resign. So far five names have been mentioned as successors. The attitude of two of these toward mining is well known. Both are internationally minded—one leaning toward the left and the other leaning to the right, lately with financial interests in Mexico, Brazil, Egypt and India.

It has been suggested that a former secretary might rejoin the cabinet. This gives no comfort to miners, for we know his record. It will be remembered that there is a textbook circulating in Washington showing the method for the infiltration of fellow travelers into departments. When the author of this book was fired by action of Congress, he was taken into the Department of Interior and placed in the power division. For six months his name did not appear in the department directory, nor was it on any door, except for a small card on the corner of the glass. Miners certainly do not want similar past tactics repeated.

In a few weeks the next campaign in the war against the mining industry will become active. Articles in technical papers are not enough, for they are not read outside the industry. The main work must be done by the members of the twenty-odd mining associations. Every senator and congressman should be personally told about the problems of our industry before he is tied down by his work in Congress. What are YOU going to do about it?

*'The Wanderer*




**Spittercord**  
safety comes  
before speed  
and control


**but now you get all three**

This positive firing device controls firing order and saves time at face—and, most importantly, *assures safety.* It makes possible the consecutive lighting of all safety fuses of a round—from a single point of ignition. Because Spittercord burns at a uniform rate, a predetermined lighting interval can be worked out for each round. Please write for literature and hook-ups.

**COAST MANUFACTURING & SUPPLY CO.**

Livermore, California





**FREE FLOWING  
HIGH ALKALINITY  
UNIFORM**

**AMERICAN POTASH & CHEMICAL CORPORATION**

3030 W. Sixth Street Los Angeles 54, California

# MINING MEN AND THEIR ACTIVITIES

About men who are well known and prominent  
in American metal mining circles

William P. Crawford was recently promoted to general superintendent of the Copper Queen Branch, Phelps Dodge Corporation, at Bisbee, Arizona. Another promotion was effected at the corporation's United Verde Branch at Jerome, where William W. Little is now mine superintendent.

Colwell A. Pierce, general superintendent of the United States Potash Company at Carlsbad, New Mexico, retired recently and has been succeeded by Henry H. Bruhn, former refinery superintendent. In his new capacity as resident manager, Bruhn has general supervision of both mining and refinery operations. Russell H. Mills, refinery foreman since 1932, is the new superintendent of the refinery.

Dr. A. B. Parsons, who resigned recently as secretary of the American Institute of Mining and Metallurgical Engineers, is making his home at 6091 Castle Drive, Oakland, California.

R. R. Weideman, formerly superintendent of the Silver Dollar mine in Idaho's Coeur d'Alene mining district, has been promoted to assistant to the manager of the Silver Dollar Mining Company and its affiliates. With headquarters in Spokane, Weideman will be in charge of all the firm's development and mining activities.

Arthur S. Hecht, consulting mining engineer for the department of commerce, USAFIK, Korea, recently returned to the United States from Korea. He is being retained by the civil affairs division of the army to act as consultant on technical matters concerning ore beneficiation tests now in progress in the United States. At the present time, he may be addressed at 342 27th Avenue, San Francisco 21.

George H. Ryan of Salt Lake City is now engineer and superintendent at the property of the Castle Mountain Mining Company undergoing development at Austin, Nevada. H. R. Fisher, 222 Atlas Building, Salt Lake City, is president and manager.

J. C. Landenberger, Jr., general track foreman of the Utah Copper Division, Kennecott Copper Corporation, has been elected 1949 chairman of the Utah section, A. I. M. E. He succeeds W. C. Page, assistant to the vice-president and general manager of the U. S. Smelting, Refining and Mining Company.

Ian L. Reid, chief engineer of the eastern district for the Oliver Iron Mining Company, has moved from Ely to Virginia, Minnesota.

Ernest Wittenau, manager of the New Cornelia Branch, Phelps Dodge Corporation, Ajo, Arizona, retired from active duty with the corporation on December 1. Wittenau entered the employ of Phelps Dodge in 1915 and has held various positions with the company, both at Ajo and Morenci. It was under his direction as general superintendent that the huge open-pit mine at Morenci was developed and concentrating and smelting facilities erected. On January 1, 1946, he was appointed manager of the New Cornelia Branch and since then has directed the electrification of the haulage system at the Ajo open-pit, the enlargement of the power plant, extensive additions to the Ajo town-site and initial work on the erection of a smelter at Ajo. He expects to make his home on the Pacific Coast.

A. D. Hahn, manager of Forest Queen Mines, Inc., is now professor in charge of the geology and surveying departments at Western State College, Gunnison, Colorado. Forest Queen operations at Irwin, Colorado, have been suspended during the winter months.

W. A. Linfesty, superintendent of the Tungstar Corporation, is now residing at 3016 Alta Vista Drive, Bakersfield, California, having moved from Bishop.



M. DEAN LA-GRANGE, JR., has joined the staff of The Eimco Corporation as Chief Applications Engineer. LaGrange was formerly Superintendent of Mines, Ray Mines Division, Kennecott Copper Corporation, Ray, Arizona.

W. A. Chabert, Jr., is now associated with the American Engineering Products Company, 225 Lafayette Street, New York City, in the capacity of consulting engineer, having retired as a Lt. Colonel from the Corps of Engineers, U. S. Army.

Warren L. Howes, until recently consulting metallurgist at San Diego, California, has accepted the position of chief engineer-manager of the Hibbing Branch, Western-Knapp Engineering Company, 220 Power Building, Hibbing, Minnesota. He succeeds J. H. Glennon, who is now with the firm's principal offices in San Francisco.

Marie J. Gabelic has resigned her position as secretary to the firm of Rowe, Gabelic and Buehler, 1555 Sunset Avenue, Pasadena, California, to devote more time to the development of her silver-lead mining claims.

LeRoy Kienitz, mining engineer of Rollo, Missouri, has accepted a position with Pickands, Mather & Company at Crosby, Minnesota.

Plato Malozemoff of New York City, mining engineer with the Newmont Copper Company, recently spent some time in Superior, Arizona, on professional work for the Magma Copper Company.

A. F. Carper has just assumed the position of superintendent for the Tungstar Corporation and may now be addressed in care of the corporation, Bishop, California.

F. C. Rowe of Silver Plume, Colorado, has accepted a position with the Molybdenum Corporation of America at Lewiston, Idaho. Formerly, he was with the company's Urad molybdenum mine in Colorado, operated during and immediately following the war.

Clarence B. Randall has been appointed assistant to the president of the Inland Steel Company. He was formerly staff assistant to the president.

Walter C. Lawson has assumed his duties as manager of the New Cornelia Branch, Phelps Dodge Corporation, Ajo, Arizona, succeeding Ernest Wittenau, retired. Lawson was first employed by Phelps Dodge in 1926 as a mining engineer at Ajo. In 1937 he was transferred to the Morenci Branch as chief mine engineer, becoming mine superintendent in 1942. He was made general superintendent of the Morenci property in 1946, continuing in that capacity until his return to the New Cornelia Branch as general superintendent on September 1, 1948.

Lewis G. Nonini has just returned from Korea, where he completed a contract as advisor to the Nippon Mining Company. He is now residing at 5 Spruce Street, Wallace, Idaho.

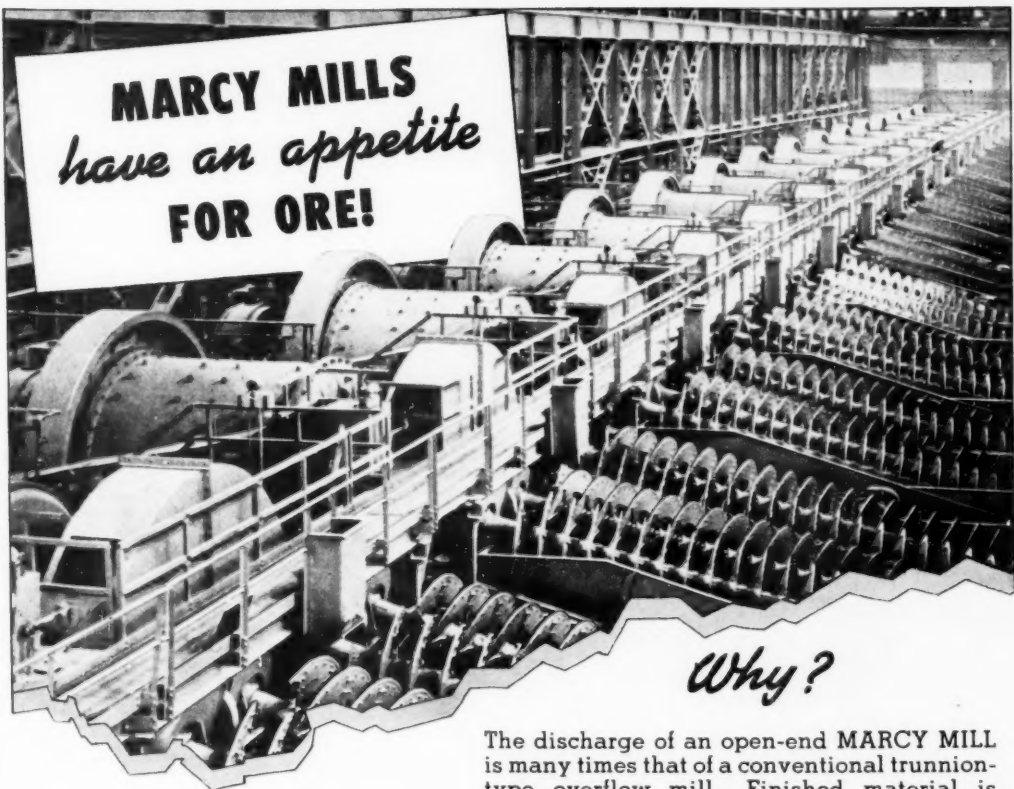
Arthur F. Peterson has been elected vice-president in charge of the mining division of the Bethlehem Steel Company to succeed the late M. L. Jacobs. Peterson has been with Bethlehem Steel since 1924.

John L. James, formerly in charge of operations for the Manhattan Gold Dredging Company at Tonopah, Nevada, may now be addressed c/o Natomas Company, Battle Mountain, Nevada.

William Sharp is now manager of the Consolidated Eureka Mining



**MARCY MILLS**  
*have an appetite*  
**FOR ORE!**



*Why?*

The capacity per shift of all **MARCY MILLS** now in operation constitutes a staggering tonnage. In all ore dressing: iron, copper, lead, molybdenum, gold, nickel, zinc, silver, and all the rest, a high proportion is ground in **MARCY MILLS**. With the necessity of working lower grade ores, only lower milling costs can maintain operations at a profit. Far-seeing plant mining men have taken this into account in their grinding sections by installation of **MARCY MILLS**.

The discharge of an open-end **MARCY MILL** is many times that of a conventional trunnion-type overflow mill. Finished material is discharged quickly, without wasteful overgrinding. Ball cushioning is less in a **MARCY BALL MILL**; impact and effective grinding much improved. The advantages are increased tonnage, lower per-ton cost and vastly improved metallurgy in any following flowsheet.

Operating costs are lower because of lower power requirements in **MARCY MILLS**. Their tough, long-lived liners and grates are easily replaced, and grates have an exceptionally long life. For lower costs in your grinding sections, consider the advantages of **MARCY MILLS**. Permit our engineers to consult on any grinding problem.

Main office: Denver, Colorado, U.S.A.  
El Paso, Salt Lake City, 1775 Broadway, N. Y.

Canadian Vickers, Ltd., Montreal  
W. R. Judson, Santiago and Lima

The Edward J. Nell Co., Manila, P. I.

Mosco Fahrenwald Flotation Machines;  
Gossine Wilfley Tables; Mosco-  
McCarthy Hot Millers; Rock Bit Grinders;  
Density Controllers; Belt Feeders; Pinch  
Valves; Assay and Laboratory Supplies  
and Equipment; Complete Milling  
Plants; Constant Shi Lifts.



The  
**Mine & Smelter**  
Supply Co.



Company, Eureka, Nevada, succeeding *Sherman Hinkley*, who has become manager of Rico Argentine Mining Company at Rico, Colorado.

*Carol Ward*, superintendent of the Emery mine until its closure, has moved from Deer Lodge, Montana, to 1104 Leslie Street, Helena. *John B. White*, lessee at the mine, has moved to 820 Quartz Street, Butte.

*M. C. Brown*, general superintendent of the Sidney Mining Company, is now located at 101 West Mission Avenue, Kellogg, Idaho.

*D. F. Peters*, president of the Arizona Lead Mines Company, has moved from Los Angeles to 1329 East A Street, Ontario, California.

*R. C. Gebhardt*, geologist with the E. J. Longyear Company of Minneapolis, recently made a business trip to the Cripple Creek gold mining district in Colorado.

*Warren Bicknell, Jr.*, president of the Cleveland Construction Company, has been elected to the board of directors of the M. A. Hanna Company.

*B. S. Richards*, superintendent of Pickand, Mather & Company's Zenite mine at Ely, Minnesota, was a recent visitor at Wallace, Idaho.

*Russell C. Fish*, general manager of the M. A. Hanna Company, Duluth, Minnesota, recently completed an inspection trip of the company's Michigan mines.

## WRITE US!

Have you changed your address or your job recently?

Readers of this section will be interested!

MINING WORLD subscribers, among whom are many of your friends, want to know what you are doing now.

Let's hear from you!

*William Allen, Jr.*, geophysical engineer for Phelps Dodge Corporation, has changed his address from Heber City, Utah, to 556 Thirteenth Street, Douglas, Arizona.

*John J. Chapman*, who is with the U. S. Geological Survey, is now being addressed c/o N. Walker, Rt. 2, Clyde, North Carolina.

*Philip R. Lynch*, superintendent of the Phelps Dodge Corporation operation at Tyrone, New Mexico, until his recent retirement, has been named superintendent of the general hospital at Silver City.

*Oscar A. Fischer* of Pennsylvania Gold & Silver Mines, Inc., has moved his office to 250 Equitable Building, Denver 5, Colorado.

*Perry F. Roys* of East Helena, Montana, is now on the faculty of the Montana School of Mines as an instructor and researcher in the economics of the mineral industry.

*Fred D. Kay* was recently elected vice-president of the International Titanium Corporation, 120 Broadway, New York City.

*Michael Schwarz*, wartime chief of the Copper Division, War Production Board, has been appointed an advisor to the Federal Bureau of Supply in connection with procurement of metals for the stockpiling program.

*Ray D. Nolan*, St. Paul, director of the Minnesota Department of Lands and Minerals, was a recent visitor to the Hibbing district.

*J. P. Skinner*, mining engineer with the U. S. Bureau of Mines, has been transferred from the Birmingham, Alabama, office to the Duluth district.

*Otto D. Rohlf, Jr.*, formerly general manager for Nevada Scheelite, Inc., at Rawhide, Nevada, was recently appointed assistant superintendent for the Mayflower mine of the New Park Mining Company, Keetley, Utah.

*David White*, formerly geologist with the Alcoa Mining Company, has joined the staff of the Oregon State Department of Geology and Mineral Industries.

*Roy E. Hall* recently accepted the position of engineer with the Idarado Mining Company at Silverton, Colorado.

*Dr. Irving D. Ewart*, owner, Twin Peaks Milling & Mining Company, has changed his address from 6331 Hollywood Boulevard, Los Angeles, to General Delivery, Pasadena, California.



## Designed for every mining job

**SHAFT ROPES.** Bethlehem Shaft Ropes are designed to handle heavy loads with maximum safety. They are thoroughly dependable for all depths, at any conventional operating speed.

**PLANE ROPES.** Bethlehem Formset (Preformed) plane ropes are tension-free and flexible for easy handling. Their rugged outer-wire construction resists abrasion from rollers, ties and rocky ground.

**MUCKING ROPES.** Bethlehem Formset (Preformed) ropes for scraper mucking are pliable and long-lasting. They have the flexibility needed for winding on small drums or for passing around small sheaves.

**DREDGE ROPES.** Bethlehem Dredge Ropes are made in all sizes, constructions and grades needed for gantry guys, stacker lines, swing lines, spud hoist lines and other placer mining jobs.

**OTHER BETHLEHEM PRODUCTS FOR METAL MINING.** Hollow Drill Steel. Mine-Track Equipment. Mine Cars. Wheels and Axles. Bolts, Nuts and Spikes. Roofing, Siding, Pipe.

**BETHLEHEM PACIFIC COAST STEEL CORPORATION**

Sales Offices: San Francisco, Los Angeles, Portland, Seattle, Honolulu

**BETHLEHEM PACIFIC**



**AMSCO**®

Unretouched illustration of Amsco special manganese steel grates . . . after handling 193,797 tons of gold bearing quartz rock in ball mill.

# BALL MILL GRATES

*after 193,797 tons*

Where operations involve impact and abrasion, you will find Brake Shoe facilities a sure source for wearing parts that will stand up longer . . . to give you important reductions in operation cost.

A case in point is the grates used in ball mills. In one application Amsco special manganese steel grates handled a total of 193,797 tons of gold bearing quartz rock . . . without requiring repair of any kind. In addition, slot peening and "blinding" were so little that an acceptable grind was obtained throughout the operating period. In another comparable installation, with Amsco special manganese steel grates, a total of 176,360 tons of quartz rock was handled at a cost of \$0.00369 per ton. An important factor was demonstrated here also: while the previous grates gave a 136,923 ton service life, repair was required during this period totalling

29¼ hours; this lost time cost an estimated \$200.00 per hour in lost tonnage.

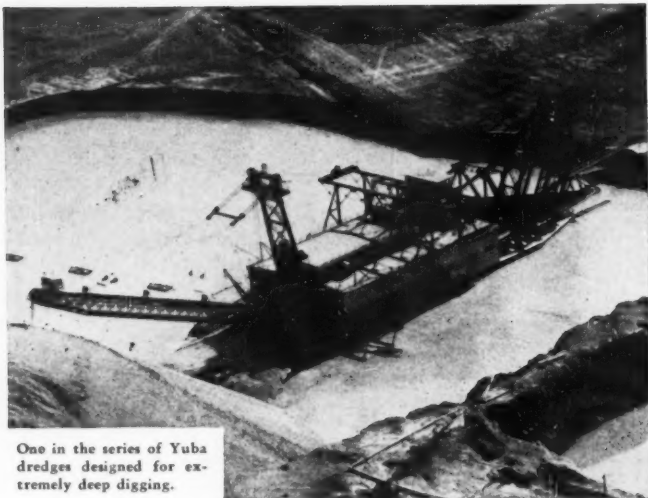
The reason for such outstanding performance with Amsco parts is threefold: (1) Brake Shoe metallurgical research in manganese steel and other alloys makes possible the selection of the best steel or iron to cope with the specific job conditions; (2) Amsco application experience supplementing that of the mill operator often results in design improvements that alone can greatly lengthen operating life; and (3) Amsco foundry practice produces castings with uniform grain structure and dimensional accuracy.

If you think that your mill grates, liners or feeder lips are costing you too much per ton of ore ground, we may be able to help in the solution of your problem. All uses for Amsco alloy steels in metal mines and mills are described in Bulletin 743-M.

**AMERICAN****Brake Shoe****COMPANY****AMERICAN MANGANESE STEEL DIVISION****CHICAGO HEIGHTS, ILL.**

Foundries at Chicago Heights, Ill., New Castle, Del., Denver, Colo., Oakland, Calif., Los Angeles, Calif., St. Louis, Mo.  
Offices in principal cities. In Canada: Joliette Steel Limited, Joliette, Que.

# Now You Can Have Yuba Dredges with Buckets 27 cu. ft. and Larger



One in the series of Yuba dredges designed for extremely deep digging.

## YUBA Leads in Deep-digging, Big-capacity Dredge Design; Can Make Good Delivery

Today many properties require deep digging dredges and capacity to handle big yardages. To meet these requirements, Yuba now is prepared to furnish bucket ladder dredges with capacities of 27 cu. ft., or larger, and digging depths from 15 feet or less, to 150 feet. We design and build dredges with all bucket capacities from the smallest to the largest.

### DESIGNED TO YOUR NEEDS

Each dredge that Yuba builds is individually designed to meet the exact needs of the work to be done; the first consideration is your operating conditions. Whether your dredge work requires ability to handle deep-ground, hard bedrock, clay, boulders, levee building, stream control, or any other problem—we can help you.

### YUBA COOPERATES WITH YOU

For 40 years Yuba has pioneered and led the field in designing and building dredges which are in use today all over the world. This world-wide experience is available to you. Your operating skill and knowledge of your property, plus Yuba's engineering and operating experience, form the winning combination that will produce the successful dredge for your special requirements.

Consult Yuba NOW. No obligation. Wire or write us today.

## YUBA MANUFACTURING CO.

351 California St., San Francisco, California, U. S. A.  
 AGENTS: SING SAREY & CO., LTD., SINGAPORE, KUALA LUMPUR, PENANG.  
 SHAW SAREY & CO., LTD., 14 & 19 LEADENHALL ST., LONDON, E.C.3.  
 CABLE: YUBAMAN, San Francisco. SHAWSARCO London.



If you need special equipment built to your order, Yuba has complete steel fabricating and machine shop facilities. Send us your blueprints or specifications for prices.

## GRAB SAMPLES From the Mail

Dear Sir:

I thank you for the copy of **WORLD MINING** recently sent to me which I found of great interest.

Of particular interest to me was the article on spiral concentration, and I would be grateful if you would let me have the address of the manufacturers, presumably Humphrey Gold Corporation, Denver, Colorado.

Yours faithfully,

M. Deline Chadcliffe,  
 Manager,  
 Southern Tronoh Tin  
 Dredging, Ltd.  
 Tanjong Tualang,  
 Perak, Malaya

Dear Sir:

Thank you for your introductory copies of **MINING WORLD** and **WORLD MINING**. . . I read them through with the greatest interest and must say that I was very favorably impressed.

Articles giving actual operating data, such as those on the Greater Butte project, Humphreys Spiral and the dredge operation, as opposed to more speculative subjects are, I feel, the very essence of good technical periodicals—and the more figures and statistics in them, the greater their value.

May I suggest, therefore, that more of this type of article would greatly enhance **WORLD MINING**.

Sincerely yours,

G. G. Stanley,  
 Geduld Proprietary  
 Mines, Ltd.  
 Transvaal, South Africa.

Gentlemen:

I am in receipt of your publication **WORLD MINING**, an introductory copy of which you have so kindly sent me as well as to our managing director, Mr. Y. Atsumo. I thank you for the great favor and shall appreciate it if you will continue sending me future issues of this publication.

In spite of its limited number of pages, it is very informative, especially in regard to mining equipment and will certainly prove helpful in the choice of suitable equipment whenever such may be required in the future.

With grateful acknowledgments and indebtedness, I am,

Yours truly,

Kusuo Okabe,  
 President and director,  
 The Nippon Mining Company, Ltd.  
 Tokyo, Japan

Dear Sir:

Having received a recent edition of **WORLD MINING**, I wish to congratulate you and the efficient Miller Freeman organization for your originality in presenting mining news of an international character.

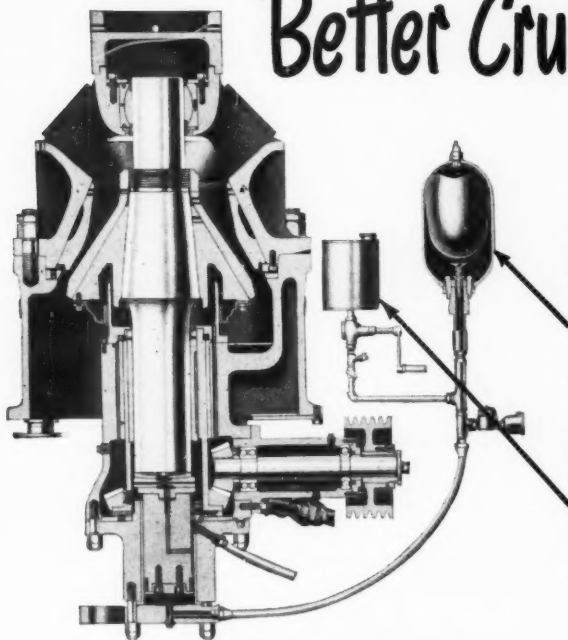
I know that your interesting review will have a wide and cordial reception, principally in countries such as ours where there is much interest in new mining business and where great perspectives for business men or North American capital exist.

Yours very truly,

L. G. Amenabar Chadwick,  
 Mining engineer,  
 Copiapo School of Mines  
 Santiago, Chile

**MINING WORLD**

# These TWIN FEATURES give you Better Crushing!



## 1. AUTOMATIC RESET

No "time out" to dig out your *Type R* crusher after stoppages! Automatic Reset hydraulically lowers the entire crushing head to pass tramp iron, etc. . . . then eases it back to original setting . . . without shock or costly interruptions.

## 2. "SPEED-SET" CONTROL

You get quick adjustment of product size with *Type R* crusher. With "Speed-Set" control you can adjust product size to exacting specifications instantly—without stopping crusher! Precision control with just the turn of a hand crank.

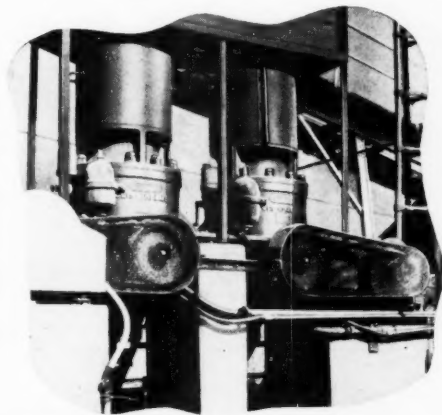
Speed-Set is an Allis-Chalmers trademark

### OTHER TYPE "R" FEATURES

In the *Type R* crusher you'll have all-steel construction, with top shell and spider cast integral. Recessed spider cap results in an even distribution of feed and permits buried crusher operation.

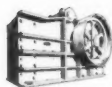
Shape of the crushing chamber is important, too. Allis-Chalmers has developed this crusher with a scientifically designed crushing chamber that gives you — by actual comparison — greater capacity and a more cubical product! It's built with an eye to easy maintenance. Self-tightening concave requires no zincing, is easy to remove. Replaceable parts are easy to install. Ask the A-C representative in your area about these and other important features of the *Type R* crusher, or send for Bulletin 07B6006D. Offices or distributors in principal cities in the U. S. and throughout the world.

ALLIS-CHALMERS, 985A SO. 70 ST.  
MILWAUKEE, WIS.



# ALLIS-CHALMERS

A 2550



Jaw Crushers



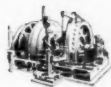
Vibrating Screens



Mills



Kilns, Coolers and Dryers



Hoists



. . . and Other Equipment for the Crushing, Cement and Mining Industries



# Bear Brand Xanthates

- Z-3 POTASSIUM ETHYL
- Z-4 SODIUM ETHYL
- Z-5 POTASSIUM AMYL
- Z-6 POTASSIUM PENTASOL AMYL
- Z-8 POTASSIUM SEC. BUTYL
- Z-9 POTASSIUM ISOPROPYL
- Z-11 SODIUM ISOPROPYL

This series of fine collectors is continually being developed and expanded to meet the problems of ore concentration throughout the world. We invite your inquiries concerning flotation concentration.

GREAT WESTERN DIVISION  
**THE DOW CHEMICAL COMPANY**

SAN FRANCISCO 4, CALIFORNIA, U. S. A.

PIONEER PRODUCERS OF XANTHATES FOR METALLURGICAL USE



# WORLD MINING

The International Department of MINING WORLD

SAN FRANCISCO, CALIFORNIA

JANUARY, 1949

## INTERNATIONAL PANORAMA

**TEXAS**—Effective immediately, the price of antimony has been raised  $3\frac{1}{2}$  cents per pound to  $38\frac{1}{2}$  cents at Laredo, the result of increased costs for labor and raw materials.

**ARGENTINA**—Acting to check gold speculation, the Argentine government threatens to apply anti-profiteering laws to exchange houses and importers, according to a Buenos Aires report. The decree is awaiting the signature of President Juan Peron at this writing.

**BRAZIL**—Late word from Rio de Janeiro brings the advice that the U. S. Steel Corporation will study the possibilities of Brazil supplying 200,000 tons of manganese ore for the corporation's furnaces. Benjamin Fairless, president of the firm, was in Brazil late in November conducting a survey of manganese and other ores.

**GOLD COAST**—A late announcement from Accra gives an indication that the government has acted to free marginal gold producers from the gold tax. The new tax, levied on gold output in place of the old gold export duty, is applied on a sliding scale according to the ratio that profits bear to gold mined.

**AUSTRALIA**—Since the New Zealand pound was revalued to parity with sterling, talk has been going the rounds that the Australian pound may soon follow and be revalued upwards. General gloom is felt in Canberra and the gold-producing districts of the sub-continent.

**NEW YORK**—With supplies of cadmium continuing tight and well below demand, the price of sticks and bars has been advanced 10 cents a pound to \$2.00 a pound in wholesale lots. Cadmium anodes and patented shapes also have been advanced 10 cents to \$2.10 per pound.

**TRANSVAAL**—Although 1948 gold production in this area reached less than half the 1947 output, G. F. Fourie, government mining commissioner of Pietersburg, reports base metal and mineral production is making steady progress. Pegging of new ground has increased extensively, particularly in asbestos and copper.

**CHILE**—Twenty miles north of La Serena, Bethlehem Chile Iron Mines is making studies of the Romeral iron deposit, estimated to contain 18,000,000 tons of high-grade iron ore. Efforts are also being made to find an adequate port from which ore may be shipped to Sparrows Point.

**VANCOUVER**—It is reported that shipments, involving a possible 1,000,000 tons of iron ore, will be made to the United States from a recently discovered deposit on Vancouver Island, 120 miles north of Victoria.

**MEXICO**—Mexican mining interests are intensifying their demands that metals and minerals be exempted from the recently enacted extra 15 percent ad valorem tax on exports. Claiming the tax is a serious threat to the future of Mexico's mining operations, most of which are of low grade, it was pointed out that 13 small companies already have been squeezed out.

**AUSTRIA**—Modernization of production and transportation facilities are resulting in a steadily increasing production at the Erzberg iron mine. A production of more than 1,200,000 metric tons is reported for 1948.

**POLAND**—M. Dietrich, president of the Central Office of Economic Plans, has announced that 1948 mining production figures have topped those of 1938. He attributed the favorable results to the government's nationalization plan.

**UTAH**—Park City Consolidated Mines Company is preparing to launch an extensive development program at its Park City property, following completion of an exhaustive rehabilitation program begun in 1947 after a five-year shutdown. Considerable equipment was shipped from the company's Missouri property for use in the new campaign.

**INDONESIA**—According to Netherlands East Indies trade officials, Indonesian tin production exceeded its prewar record by 10,000 tons in 1948 with an output of 35,000 tons. An all-time high of 50,000 tons is expected in 1950 if restrictions are not placed on mining operations.

**MINNESOTA**—The Hill-Annex iron mine at Calumet again was the leading producer of state fee mines in 1948, with a total of 2,375,829 gross tons of ore shipped.

**MISSOURI**—Milling operations are being stepped up to 500 tons daily by Park City Consolidated Mines at its Fredericktown operation. Lead ore reserves are in excess of 500,000 tons, sufficient to keep the mill in operation for five years.

**KENYA**—The Kenya Mines Department at Nairobi reports a promising gold strike at Kibigori near Kisumu, where visible gold has been found. The formation extends at least five miles.

**MOROCCO**—The Society of Moroccan Siderite Studies, with a capitalization of 10 million francs (32 percent of which is controlled by the local government), is contemplating the possibilities of refining Moroccan iron ore and utilizing Algerian fuel.

### San Manuel Has Completed Surface Plant at Tiger

The San Manuel Copper Corporation, subsidiary of the Magma Copper Company, reports that the surface plant required for the sinking and exploration program at its operation near Tiger, Arizona, has been completed.

The installation includes a power plant, containing three G. E. 1,000 kw. generators, driven by Cooper-Bessemer gas diesel engines, and two C. P. air compressors, one of 1,600 and one of 1,800 cu. ft. per min. capacity. Natural gas is supplied at 500 lbs. pressure through 20 miles of four inch pipe, laid recently by the El Paso Natural Gas Company.

Two shafts will be required for the underground exploration program. The first, already under way, will be a permanent four-compartment structure which will be carried to a depth of 2,140'. The second, with three compartments, will be started soon and sunk to a depth of 1,960'.

San Manuel has developed an ore-body estimated in excess of 460,000,000 tons which will be mined at a rate of 25,000 to 30,000 tons daily.

### Kennecott to Build First Copper Refinery in Utah

D. D. Moffatt, vice-president of Kennecott Copper Corporation, Utah copper division, has announced the awarding of a contract to Andrew Knap Construction, Inc., New York, for installation of lead lining and lead pipe in what will be the first copper refinery in Utah.

To be located near Garfield, the refinery will have an initial capacity of 12,500 tons of finished copper per month. Excavation for the plant already is under way.

### Norwegian Copper Again Being Refined in Hamburg

Several Norwegian mining companies, including Sulitjelma Gruber, Orkla and Foldal, are once again starting shipments of copper concentrates to Hamburg for refining, as they did before the war.

Until now, postwar refining had been done at Swedish, Finnish, and Belgian plants; however, Norwegian copper, which contains both gold and silver, may be more advantageously handled by the electrolytic refining

## WORLD MINING

Issued as an International  
Department of  
MINING WORLD

by American Trade Journals,  
121 Second St., San Francisco,  
California.

## A Miller Freeman Publication

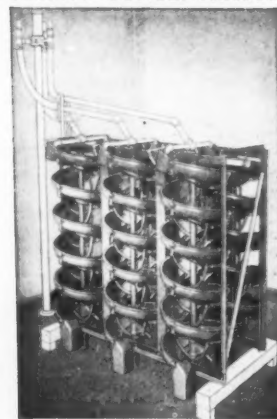
President . . . MILLER FREEMAN  
Publisher . . . W. B. FREEMAN  
General Manager . . . M. F. HOLSINGER  
Editor . . . JOHN B. DORSH, E. M.  
Production Manager . . . E. B. HERINGTON  
Eastern Manager . . . K. WEGKAMP

Regular correspondents in the following  
cities and mining centers:

Santiago, Antwerp, Stockholm, Cyprus,  
Tientsin, San Jose (Costa Rica), Baguio  
(Philippines), London, Tokyo, Frankfurt,  
Medellin (Colombia), Strangways (Victoria,  
Australia), Vancouver, Paris, Bangkok,  
Mexico City, Helsinki, Yananara (Madagascar),  
Redruth (Cornwall), Oslo,  
Benares (India), Dersley (Transvaal,  
South Africa), Budapest, Singapore, Buenos Aires,  
Lisbon, Madrid, Ankara, Lima, Rome, Sao Paulo.

WORLD MINING is published the 15th  
of each month as a regular department of  
MINING WORLD and is also circulated  
as a separate section on a carefully  
controlled free basis to a selected list of  
management and supervisory personnel  
associated with active mining enterprises  
throughout the world.

## HUMPHREYS SPIRAL CONCENTRATOR



LOW COST OF INSTALLATION  
NO MOVING PARTS  
LOW OPERATING COST

Engineering Division

The Humphreys Investment Co.  
907 First National Bank Building  
DENVER 2, COLORADO

process in Hamburg. By processing the concentrates in Germany, it is expected that more silver will be extracted than is taken from the Norwegian silver mines at Kongsberg.

At present, Sulitjelma is smelting its own ores, while Folldal's output is treated in Roros. Orkla, which is smelting a part of its production, will now send its crude ore direct to Germany.

Because of the present situation of the copper market, the copper will be returned to Norway following refinement.

### Bagdad Increasing Mill Capacity to 4,000 Tons

Making progress toward its eventual goal of 10,000 ton daily capacity, the Bagdad Copper Corporation at Bagdad, Arizona, is installing an additional ball mill to increase the present 3,000-ton mill capacity to 4,000 tons.

Copper ore for the Bagdad mill is obtained by open-pit mining methods which were first initiated in 1945. The material is loaded by a 2½ yd. shovel into 10 yd. trucks and hauled to the jaw crusher in the pit.

This crusher, with a capacity of 3,000 tons in 12 hours, crushes to six inch size and discharges by means of a short-length conveyor into storage bins excavated out of rock. Material from the storage bins is delivered to the mill by a 36" conveyor, 1,000' in length and rising at an angle of 17½ degrees.

The original Bagdad orebody was estimated at 6,000,000 tons of 1.25 percent copper available for underground mining. Today, diamond drilling has made about 18,000,000 tons of 0.9 percent copper available for open-pit operations.

### Japan Bucking Obstacles In Pyrite Industry

Japan, which had become the world's leading pyrite producer just before the war, is facing difficult obstacles in one of its mining industry's most urgent problems, that of regaining its prewar output of pyrites.

Last spring the government promised farmers a supply of 185.5 lbs. nitrogen fertilizer and 70 lbs. phosphate fertilizer per acre for the spring seeding. By March, production of 90,000 tons was achieved, and in June the government launched a 100,000 tons monthly plan.

It is this plan that is now being threatened by an inadequate price policy, communist agitation in the Yanahara mine (one of the leading producers), and the inadequate transportation system in the Tohoku

district, where most of the pyrite mines are situated.

At this writing, a conflagration which broke out in September at the Yanahara mine in Okayama over compensations for silicosis contracted by workers and overtime wages, remains unsettled. Fanned by communist agitators, the dispute between the Dowa Mining Company and the union may well cause a drop in production from the 30,000-ton monthly quota set forth in the plan.

Transportation difficulties are faced by the Matsuo Mining Company, operator of the Matsuo mine, which has the largest pyrite deposit in Japan (90 percent of Japan's total pyrite resources). Railway facilities are poor, and improvements are being rushed at the port so that tide water transportation can be utilized. Two retired vessels have been sunk to build water breakers, a new time-saving technique adapted in Japanese civil engineering. Open-pit mining is also under consideration at the Matsuo, but the problem of necessary funds first must be solved.

Because of these difficulties encountered in Japan's pyrite progress, the government is considering importing 50,000 tons of Canadian pyrite. At \$16 a ton, this is three times the cost of Japanese pyrite when converted into yen. Nevertheless, if the domestic situation is not improved in the near future, this step will be unavoidable, for the miners themselves acknowledge that the quantity is necessary.

### Boom May Follow Uranium Strike in Ontario

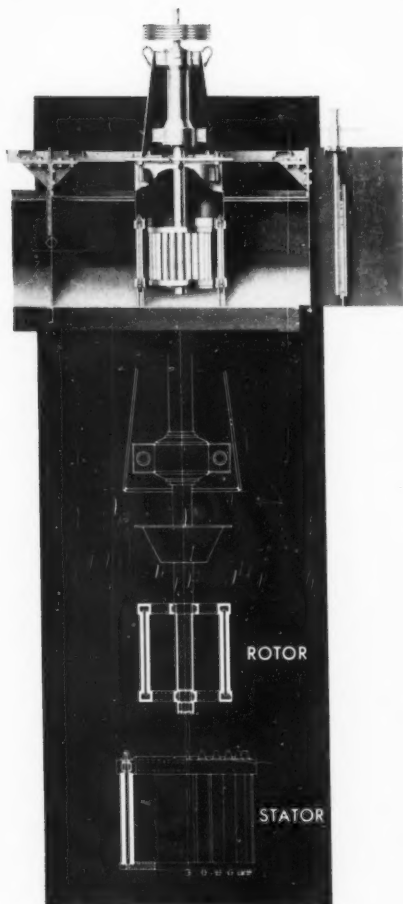
Prospectors are rushing into what was formerly uninhabited bushland on the northeastern shore of Lake Superior, 70 miles north of Sault Ste. Marie, following the discovery of what is regarded as an important pitchblende deposit.

The strike was made by Robert Campbell, head of the Camray Mining Syndicate, for which he has now staked out 1,200 acres in claims. The pitchblende, bared by erosion, was spotted in coastline rock at Theano Point. Assays of the ore are said to have shown 59.1 percent uranium.

In addition to the Camray and individual prospectors' claims, Algoma Ore Properties, subsidiary of Algoma Steel Company, has staked more than 100 claims of 40 acres each, just south of the Camray holdings.

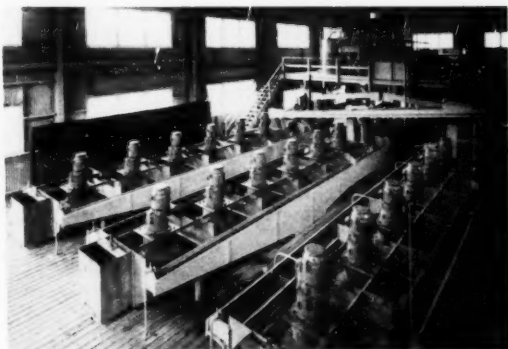
Although the extent and commercial possibilities of the pitchblende deposits have not yet been ascertained, there is a growing belief in the importance of the discovery, and Sault Ste. Marie will be prepared if a boom does break.

# **NOW! The FAGERGREN Flotation Machine** **is another WEMCO product**



Intense aeration and agitation of pulp are accomplished by the unique Rotor-Stator design. Higher speed of float and greater metallurgical capacity result.

- Acquisition of exclusive manufacturing and sales rights to the famous Fagergren Flotation Machine marks another forward step in WEMCO progress.
- To the mineral engineering industry, this combination of superior design and proven engineering experience assures the aggressive development and improvement of flotation methods.
- The adaptability and high efficiency of the Fagergren Flotation Machine combined with the practical engineering competence of the WEMCO organization are guarantees of superior results in the treatment of both metallic and non-metallic minerals. The WEMCO staff includes flotation experts of outstanding reputation in the industry.
- Prompt service to present and prospective operators of Fagergren Flotation machines is available from WEMCO field engineers throughout the United States and in many foreign countries.
- Complete warehouse inventories of replacement parts at major WEMCO offices already have been established. Inquiries and requests for servicing should be directed to one of the WEMCO offices or agents listed below.



The unit, level design of the Fagergren installation in the mill of Bagdad Copper Corporation provides flexibility in flow scheme and simplicity of installation.

## **PRINCIPAL OFFICES**

Los Angeles • Sacramento • Salt Lake City • Spokane  
Pocatello, Idaho • Denver • Phoenix • Chicago  
Hibbing, Minnesota • Bartow, Florida • New York

## **EXPORT DISTRIBUTORS**

The Ore and Chemical Corporation  
80 Broad Street • New York 4, N. Y.  
Continental Europe and North Africa  
Dr. Ing. Herbert Lickfett A/B, Stockholm 3, Sweden  
Mileu Dense, Paris, France  
Ferdinand Egeberg & Company, Oslo, Norway  
Midac, Milan, Italy  
A. Schubath & Company, Basle, Switzerland  
G. Maltisiniatis & Co., Athens, Greece  
Agence Minière & Maritime, S. A., Antwerp, Belgium  
Adil Gabay & Albert Koenko, Istanbul, Turkey

# **WEMCO**

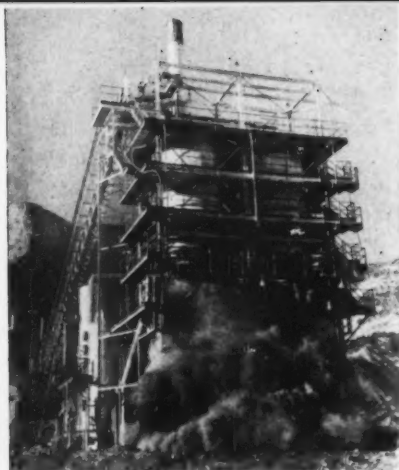
**WESTERN MACHINERY COMPANY**

760-766 FOLSOM STREET • SAN FRANCISCO 7, CALIFORNIA

WKE (HMS) Mobil-Mill • Coal Spiral • Standard Thickeners  
(HMS) Thickeners • (HMS) Media Pumps • Hydroseparators  
(HMS) Densifiers • (HMS) Separatory Cones • "SH" Classifiers  
Sand Pumps • Conditioner and Agitators • Fagergren Flotation  
Machines • Dewatering Spirals • (HMS) Laboratory Units

# OIL SHALE MINING

**Under way at Rifle, Colorado, this project may point the way to a thriving industry**



The retorts are working and 35 tons of spent shale is dumped on the ground at the end of a run in the N-T-U retort at the Bureau of Mines Oil-Shale Demonstration Plant near Rifle, Colorado. (Bureau of Mines photo)

One of a number of projects undertaken by the U. S. Bureau of Mines aimed at extracting hydrocarbons from low grade sources is the oil shale mining, retorting and refining plant at Rifle, Colorado, where an experiment is being conducted that may prove of great benefit to the nation, and its successful completion will make available a new source of petroleum products.

This project is one where government will pioneer the field by putting in an experimental mine with up-to-date equipment and install pilot plants for research programs on extracting and refining hydrocarbons from the shale.

Private industry will be free to apply any of the findings to commercial enterprises so long as they lead to development of new supplies of liquid fuels and lubricants to supplement the nation's reserves of natural petroleum. Private industry had been reluctant to begin research on the long discussed need of eventually turning to oil shale to augment our diminishing petroleum reserves, chiefly because in normal times natural petroleum could be produced at a lower cost. Therefore, the Congress, long aware of the steadily accelerating drain on our reserves of crude petroleum, passed Public Law No. 290, 78th Congress, approved April 5, 1944. The title of the law reads:

"An Act authorizing the construction and operation of demonstration plants to produce synthetic liquid fuels from coal, oil shales, agricultural and forestry products, and other substances, in order to aid the prosecution of the war, to conserve and increase the oil resources of the nation, and for other purposes."

Thus it became the role of govern-

ment to bridge the gap between natural petroleum products and the synthetic source, and it should be remembered that this work was begun during the war when unit costs were not of prime importance. Furthermore, it was thought that a moderate rise in production costs for natural petroleum would put oil shale-derived fuels on a competitive basis with the natural product.

With public money, Bureau of Mines engineers are perfecting mining techniques and extraction processes for the benefit of the people as a whole. The lessons to be learned at the Rifle plant will be applied to the rising industry of oil shale mining and processing.

In 1944 Congress authorized \$30,000,000 for a five-year program directed toward the production of synthetic fuels and made the Bureau of Mines responsible for carrying out the program. About \$6,000,000 of this sum was allocated for experimentation on oil shale at Rifle, Colorado, where work has been in progress for nearly three years, and for research on oil shale and shale oil at the Bureau's Petroleum and Oil Shale Experiment Station at Laramie, Wyoming. In 1948 Congress authorized an additional \$30,000,000 and extended the life of the program three years.

## Plant Development

Before any work could be done on the development of the oil shale, certain pioneering work had to be accomplished. Necessary was a com-

plete water-pumping, treating, and distribution system, sewer system, a camp of fifty dwelling units, garage, offices, service shops, power substation and transmission lines, boiler plant, control laboratories, ten miles of roads, the development of the mine, processing units for crushing, conveying, and storing shale, and retorts to produce oil from the shale.

To connect the mine with the plant a road was needed, and in 1945, as soon as the project was approved, road construction to the mine began. A pioneer grade 6½ miles long was completed by September of that year and climbs to the mine in five switchbacks. Grading and stabilizing were finished in 1946 and a gravel surface applied in the spring of 1947. The average grade is less than 10 percent but in several short stretches rises at the rate of about 14 percent.

An area of about one acre was excavated from the base of the cliff to provide a mine yard. This was accomplished largely with a bulldozer, although some dynamite was used to break the harder parts of the formation. A combination warehouse and office building has been built and a shop, oil house, and change house put up. All structures are of fire-resistant construction and are made of steel frames with fireproof siding.

Water is brought into the mine through a diamond drill hole from springs on the mesa above. The hole originally was drilled for exploratory purposes. Constructed also was a 13,800' transmission line from the oil plant site.

Large-scale equipment used underground keeps mining costs low at the oil-shale demonstration mine operated by the Bureau of Mines near Rifle, Colorado. Here an electric shovel with a 3 cu. yd. dipper loads a 15-ton diesel truck while holes for the next round of shots are sunk by the multiple drills mounted on the smaller truck at left. (Bureau of Mines photo)



[World Mining Section—8]



### Geology

The oil shale series make up a part of the Green River Eocene deposits which cover large areas of western Colorado and adjacent states. Although the series is many hundreds of feet thick, only about 500' contains hydrocarbons in sufficient quantity to warrant its classification as exploitable oil shale.

The shale beds being worked near Rifle dip west about 5 percent and have no local dip or strike changes. Faults are unknown, jointing planes are lacking, and relatively few vertical planes of weakness manifest themselves.

The shale is in reality a marl stone containing virtually no free oil. The kerogen content varies radically from bed to bed, but is remarkably uniform in an individual stratum. One bed, known as the Mahogany, is used as an index bed for the district. It is a dark brown and owes its color to an unusual concentration of hydrocarbons.

Physically the shale is remarkably fine grained and in certain facies appears to be truly carved. Interbedded with the oil shale are occasional lenticular sodium bicarbonate filled openings.

### Reserves and Grade

More than half of the Nation's known oil shale reserves is in the vicinity of Rifle. The recoverable oil that eventually can be derived from shales in the United States is estimated at about 270 billion barrels, or the equivalent of eleven times the proved reserves of natural petroleum recoverable by present methods.

The richest extensive deposits of known oil shale are in the Rifle district. These shales manifest themselves in huge escarpments lying north of the Colorado River between Rifle and De Beque and along tributary streams cutting through the shales. The Green River formation of western Colorado embraces an area of about 2,600 sections, most of which is underlain by oil shale. Sampled sections outline an area of about 1,000 sections underlain by rich oil shale deposits. Private holdings in the Rifle-De Beque area cover about 275 sections of land.

In 1920, some 1,400 sections of public land in Colorado, 4,000 sections in Utah, and 700 sections in Wyoming were classified as valuable principally for their oil shale content. In 1930, the Government oil shale lands were withdrawn from private entry, but excluded were tracts covered by existing and valid claims. Naval Oil Shale Reserves Nos. 1 and 3, where the experimental plant is, lie at the eastern end of the Rifle-De Beque area and cover about 100 sections of land. A part of this land does not contain oil shale but was reserved



An appreciation of the size of the main adit and the habits of the ground can be had from this picture. Shown are Emery M. Sippelle, Bureau mining engineer, and Tell Ertl, now of the Union Oil Company of California, as they talk over a detail of the oil-shale mining problem.

for plant sites. Naval Oil Shale Reserve No. 2 is in Utah.

The principal oil shale beds range up to 500' or more thick and yield an average of 15 gallons of oil to the ton. For this thickness and grade the total assay yield of shale in a square mile is of the order of 300,000,000 barrels. The series of beds under development by the U. S. Bureau of Mines at the experimental plant west of Rifle is 70' thick and will average 29 gallons of oil to the ton. One bed within this series, the Mahogany, ranging from 4 to 7' thick, assays up to 76 gallons per ton. The 70' series of beds would produce approximately 50,000,000 to 75,000,000 barrels of oil per section of land and would necessitate the mining of 100,000,000 tons of rock per square mile, more or less.

### Mining Technique

The beds under development stand at an elevation of approximately 8,200' above sea level, are about 2,500' above the Colorado River, 600' below

E. D. Gardner, Chief, Oil-Shale Mining Division, Office of Synthetic Fuels, standing at one of the most indispensable tools on the project, the Caterpillar tractor with cable lift bulldozer.



the top of the mesa, and some 10 miles west of Rifle. At present, two separate mining projects are under way. One is to supply selectively-mined material for the demonstration plant, and the second is to determine large scale mining costs.

During the 1920's, a quantity of oil shale was mined from a deposit located several miles west of the present workings. The product was used in conducting experiments in oil shale distillation at Rulison, Colorado. Upon the abandonment of the project, a mined-out room 50' by 60' was left. When the Bureau of Mines returned to begin work on the new project, the room was found to be standing in good condition. With this as a criterion of what to expect for roof conditions, thought was given to perfecting a mining system which would utilize the room and pillar system. At the same time, a 70' by 100' room was excavated in the selective mine near Rifle, wherein Bureau geophysicists set up sag gages and geophones—ingenious devices to determine the most minute rock movements—to study roof movements in the room. Furthermore, as an aid to detect roof slabbing and spalling, the roof was given a coat of paint about 18 months ago. This was applied with the idea that any falling pieces thus would scale the paint from the roof, and the sections where the roof was failing could be discovered and studied easily. To date no action has been recorded by the geophones nor have any pieces fallen from the back. Therefore, the experiments are most encouraging and the room and pillar mining system was adopted for the larger mine.

The selective mine was developed with an eye toward providing selected batches of shale to permit blending of the different strata or the production of one type of shale only for use by the distillation plant. A 12 by 14' haulage adit was driven 30' below the





The retorts and plant buildings with the small tank farm shown against the background of the Colorado River and the hills on the south side of the river.

beds to be mined; a 7 by 8' ventilation adit was extended in the beds parallel to the haulage level. The shale is mined in 40' rooms extending from raises through the beds. Three-inch and 3½" mounted drifters are used for drilling. The broken shale is scraped into the raises by 35 and 50-hp. hoists; it is drawn out at the bottom into diesel trucks for transportation to the plant. To the end of October, 1948 about 16,000 tons had been shipped to the retorting plant, and 2,000 tons elsewhere for testing.

The larger or experimental mine is equipped with full sized machinery units and is laid out to permit time and operational studies of all phases of mining. The data thus acquired can be translated to commercial installations.

The 70' thickness of oil shale will be mined in three benches with the advance heading at the top. A room-and-pillar method will be followed; pillars will be 60' square and 60' apart in a pattern staggered in one direction. Two 18 by 26' entries have been run in the side of the cliff to the mining area. The top heading has advanced far enough for the first pillar to be carved out. No work has yet been done on the middle level other than driving the entrance adit. The two lower levels will be broken by vertical down holes.

Headings on the top level are drilled from a 2-man jumbo which mounts four 4" air drills. An 84-hole round is drilled in a 27 by 60' face in a shift. The rounds are loaded from a blaster's platform mounted on a Wagnermobile fork-lift diesel truck. The broken stone is loaded into three 15-ton diesel trucks with a 3 cu. yd. electric shovel; the haul is one-third of a mile to a stockpile. A 4 cu. yd. overhead loader mounted on a D-7 Caterpillar tractor was used in running the entries and is utilized in the mines for clean-up work. A D-7 Caterpillar and bulldozer are used for cleaning up. The roof and sides are trimmed from a scaling rig mounted on a TD-9 tractor crane.

The jumbo is being modified so that 15' holes can be drilled with one piece of steel; it is expected with this improvement that 1,200 to 1,500 tons can be mined per shift on the top heading, with 11 men operating the equipment.

By far the greatest cost of mining will be drilling and breaking. The

shale is exceedingly tough and resilient, offering difficulty to breaking and handling.

Research is being continued to find the best spacing interval and depth for holes and the proper type of explosive. Hope is expressed that a system will be developed which will eliminate secondary blasting. The overall mining cost is estimated to be low.

### Crushing and Processing

The prime unit in the crushing plant is a Traylor 36 by 42" jaw crusher that can produce shale of any size up to 6" with close classification. Secondary crushing is done by a Goodroads Machinery Company 10 by 30" jaw crusher after which the shale is transported to storage bins by belt conveyors.

Two N-T-U batch retorts with a charging capacity of 40 tons each have been producing shale oil for about 18 months. These retorts are equipped with the latest types of temperature, pressure, and flow instruments and controls. A Royster process batch retort was operated for several months to obtain data, and a continuous retort with a capacity of 25 tons of shale a day was first placed in operation in October, 1948. A continuous type of retorting process developed by the Standard Oil Development Company is now being tested at Baton Rouge, La., on shale shipped from Rifle under a co-operative arrangement between the Bureau and that company, and arrangements are being made for tests

on other types of equipment through co-operation between the Bureau and other industrial concerns. The operating data obtained are studied carefully and are employed in further development of the various processes.

The crude shale oil obtained from the retorts must be refined before it can be utilized for anything other than boiler fuel. A small refinery for study of distillation and thermal-cracking processes is being erected at Rifle. If the present schedule of deliveries of machinery and other equipment can be maintained, the plans are to have the refinery in operation by the end of 1948.

### Research and Development

The five years allowed to carry out such a vast program was too short a time to find a complete answer to any of the great number of questions relative to the mining and processing of the oil shales, as it must be remembered that research and development work is never completed as one phase naturally blends into another. Congress recognized this in extending the time.

A full scale plant to produce shale oil would probably require 15,000 or 20,000 tons of shale daily with a mining plant of similar capacity. Certain areas, favorably situated, may lend themselves to open pit mining operations, but it is estimated that the greater part of the tonnage will have to be recovered by underground mining methods. Therefore, it needs no crystal gazer to foresee a great concentration of hoisting, mining and crushing equipment in the Rifle-De Beque area within the next 25 years, should natural hydrocarbon discoveries continue downward and consumption continue upward.

Certainly, sooner or later, we are going to have to turn to oil shale as a source of hydrocarbon fuels, and when necessity forces the time upon us, thanks to the U. S. Bureau of Mines, we will have the basic data, as well as many of the refinements, accomplished facts. The U. S. Bureau of Mines should be commended on a well planned and timely executed job.

Mine yard at the underground quarry where efficient mining methods are being developed and costs determined for mining oil shale on a commercial scale. Buildings house offices, miner's change room, first-aid, and supply storage facilities. Just below the parked bus, a Diesel-powered truck carrying 15 tons of oil shale to the Bureau of Mines Oil-Shale Demonstration Plant may be seen rounding a turn. (Bureau of Mines photo)





Top row: These five men described advances in mining and metallurgy. Pictured are Stanley Huckaba, sales engineer, Western Machinery Company; P. E. Oscarson, mining geologist; Dr. A. W. Fairrenwald, dean, School of Mines, University of Idaho; R. G. Macfarland, Ingersoll-Rand Company; and Robert J. Towne, Towne Equipment Company. Raymond F. Robinson, chief geologist, Sunshine Mining Company, snapped as he told of Sunshine's geological work and future program. Bottom row: These six men reported on the minerals industry during 1948 for their respective territories. They are Harry W. Marsh, secretary, Idaho Mining Association; Frank E. Woodside, manager, British Columbia and Yukon Chamber of Mines; F. W. Libbey, director, Oregon Department of Geology and Mineral Industries; Sheldon L. Glover, supervisor, Washington Division of Mines and Geology; E. N. Patty, general manager, Gold Placers, Inc., Alaska; and Carl J. Trauerman, secretary, Mining Association of Montana.

## PEND OREILLE—THE NORTHWEST'S NEWEST LARGE DEVELOPMENT

The future will match or surpass the past so far as ore discoveries and plant installations are concerned. This theme ran through the papers presented at the technical sessions of the 54th annual convention of the Northwest Mining Association in Spokane, Washington, December 3 and 4, 1948.

In the Inland Empire huge amounts of capital are being invested in new mining and milling plants and in intensified and widened exploration. More high grade ore has been discovered in the last five years than in any like period in the country tributary to Spokane, especially in the Coeur d'Alenes of Idaho and the Metaline district of Washington and finds of smaller magnitude dot the map of the Northwest.

Immense reserves of low grade material are known that will become workable with improved technological methods and much superficially explored mineralized ground will prove to be of value when detailed geological work followed by development programs is undertaken.

### The Figures

The area adjacent to Spokane provides the Nation with one-fourth of its silver, one-third of its lead, and a substantial amount of its zinc. With the Metaline district coming into production the percentage of zinc will be increased considerably.

Many other essential mineral commodities are produced in quantity in the area, among them being copper, antimony, phosphate, cadmium, gold, and tungsten. On the list for produc-

tion is cobalt and at the conference it was disclosed that Idaho had millions of tons of low grade manganese assaying about six percent that may become the source of a thriving industry.

### Plant Expansion

W. L. Zeigler, general manager, Pend Oreille Mines and Metals, in a paper, "Developments at the Reeves-McDonald and Pend Oreille Mines," told of the progress of his company in plant construction in that important and rapidly expanding district.

"Pend Oreille is enlarging its mines, plants and mills to handle 2,400 tons of ore daily," said Mr. Zeigler, formerly the Hecla Mining Company's mill superintendent in the Coeur d'Alenes and now with the new company at Metaline. "At the subsidiary Reeves-McDonald across the Canadian line another 1,000 tons daily will be handled."

He described an excursion to Metaline Falls 20 years ago and told of passing a sign on the road that read: "Put Metaline on the map—10,000 tons a day or bust—now watch her go!" and in the same year Pend Oreille bought control of the Reeves-McDonald property. A great amount of underground work was performed on both properties and they were caught in the depression of the 1930's. Production which had been 150 tons daily in 1928 was stepped up to 700 tons daily by 1937.

### New Mining Techniques

Mr. Zeigler described how the Pend

Oreille inclined shaft was sunk by use of slusher scrapers to remove the broken rock, how a tunnel was driven under the Pend Oreille River for a connection, how an underwater power house was constructed, and how a high raise was run through to the surface during the last year on the east side of the river.

A raise is now under way on the Reeves-McDonald, said Mr. Zeigler, to provide a two-compartment entrance for workmen and ventilation and will hole through to a drive about 1,000' higher than the level from which it began. This raise should be holed through about February 1.

Mr. Zeigler disclosed that about 3,000,000 tons of ore is proved in the Reeves-McDonald in the north and south orebodies. Many other deposits of possible value are known to exist in horizontal extensions or below the level of the river that may in time prove to be workable.

A 10 mile high-line is under construction from the Emerald tungsten mine by the West Kootenay Power and Light Company that will serve the 500 ton mill of the Reeves-McDonald to be in operation in 1949.

### British Columbia's Prospectors

Frank E. Woodside, manager, British Columbia and Yukon Chamber of Mines, Vancouver, told of British Columbia's part in the mineral production of the Pacific Northwest. He pointed out the great number of mining companies that are establishing offices in the area and the sums of

money that are earmarked for exploration.

Woodside touched upon British Columbia's school for prospectors and announced, "Our annual school for prospectors is again well attended, with an enrollment of 96, and we estimate that during the past 30 years we have assisted in the training of no less than 1,500 men, many of whom have gone into the hills and made important mineral discoveries. The Provincial Department of Mines, under the capable leadership of the Hon. R. C. MacDonald, Minister of Mines, again grubstaked 90 prospectors with amounts ranging from \$300 to \$500. This grubstake program has done much to stimulate interest among young Canadians in the opportunities for prospectors and to Mr. MacDonald, and his department, is due considerable credit for their foresight."

#### Northwest Mining Developments

Shelton L. Glover, supervisor, Washington State Division of Mines and Geology, gave a resume of the mineral industry for the state during 1948. A record production of minerals was recorded for the year. "During the year just ending," said Glover, "107 metallic mining properties were actively in production, had been in production within the past year or two and could be expected to resume production. This compared with 90 properties figured on the same basis in 1947."

Idaho, according to Harry W. Marsh, secretary, Idaho Mining Association, had an appreciable increase in mineral production during the year in review. In 1947 production was \$67,500,000 and in 1948 the total should approach \$70,000,000. Besides Idaho's large contribution to lead, silver, and zinc output, antimony ranked prominently during the year. "Antimony is a comparative newcomer in the metals of Idaho," declared Marsh, "but has made tremendous strides in production. Better than 96 percent of the Nation's output of antimony is mined in Idaho."

Reviewing the progress of mining in Montana for the year, Carl J. Trauerman, secretary, Mining Association of Montana, gave the highlights of developments and cited the

progress being made on the Kelly shaft of the Anaconda Copper Mining Company in connection with its Greater Butte Project. Trauerman said that some new developments had taken place in Montana during the period.

Metal mining in Oregon remained static during 1948, according to F. W. Libbey, director, State Department of Geology and Mineral Industries. He told the assembled miners, "None of the gold lode mines which closed down because of the war has resumed production. . . . There are fewer dredges operating now than during 1947 and they are all in eastern Oregon."

Modernization of the Alaska Railroad and construction of new military establishments are siphoning off the mine labor of Alaska, declared Ernest N. Patty, general manager, Gold Placers, Incorporated. Pulling the men out of the hills is seriously curtailing development of known deposits and slowing down the search for new ones.

"The gold mining industry in Alaska," said Mr. Patty, "has been reduced to only 37 percent of its normal production, chiefly by rising costs, but partly by competition of contractors working on army and navy contracts." He estimated that Alaska's 1948 mineral production would be of the order of \$14,500,000.

#### Sunshine's Geologic Problems

An outstanding paper was read by Raymond F. Robinson, chief geologist, Sunshine Mining Company, that treated of "Personal Observations on Some Sunshine Geological and Exploration Problems."

Mr. Robinson discussed at length the vein systems of the mine, but of particular interest to the gathering was the description of the methods used in exploration.

"Our approach to the solution of geologic and exploration problems," said Robinson, "makes use of several well-known tools. Each has its place in an exploration program and each has its limitations."

"One of the most important tools is actual underground mining, i.e., drifting, raising, crosscutting, etc. Theoretically, these should follow the

others to be mentioned. In this area, this has not been the case, for this method has provided us with the facts which have enabled us to know how and where to employ the other methods. However, it is the most expensive and usually the slowest approach when used alone."

"Secondly, there is geologic mapping and interpretation. This is an essential and indispensable step, in which important geological details are recorded and fitted together, making an understandable picture to which the mining exploration program can be adapted."

"Diamond drilling has in many cases proved disappointing, due to usual poor core recovery in ore and fault zones; but by eliminating barren ground and approximately indicating shear and fault zones, it provides a cheaper way of narrowing the target."

"Bulldozing as a means of surface exploration provides a cheap, quick way of getting beneath the heavy overburden of the district . . .

"Geophysical methods are useful for exploration when combined with a knowledge of the geology and mining problems of the area. . . ."

Mr. Robinson concluded with the remark that "The questions put before you are but a few of the many with which we are faced. The more we learn about ore bodies, the more questions there are to be answered. . . ."

#### Important Developments

Ranking high in interest were a number of papers that dealt with operating problems, among them being both mining and milling subjects.

Rollin Farmin, superintendent, Day Mines, Incorporated, told of "Recent Changes in Mining Practice in the Day Mines," and stressed the use of smaller diameter drill steel as a way to cut the cost of explosives. A "Report on Mining and Geologic Developments in the Pine Creek Area," by S. K. Garrett, consulting mining engineer and geologist, brought the audience up to date on that important district of the Couer d'Alenes.

Other timely papers were delivered on "The Pro-Pari Bore-Hole Surveying Instrument and Its Use in Surveying Diamond Drill Holes," by P. E. Oscarson, mining geologist; "Recent Advances in Rock Drilling," by R. G. MacFarland, Ingersoll-Rand Company; "Heavy Media Separation Process," a paper by Robert Hernlund, Western Machinery Company, read by Stanley Huckaba, sales engineer, Western Machinery Company; "Ball Mill Grinding with Centrifugal Tumbling Media," by Dr. A. W. Fahrenwald, dean, School of Mines, University of Idaho; and the "Yale Load King Scale Magnetol Mechanism and the Load King Dormant Platform Scale, as Adapted to Mine and Smelter Use," by Robert J. Towne, Towne Equipment Company.

Posed for MINING WORLD after Mr. Zeigler's informative paper on the Metaline district. C. A. R. Lamby, general superintendent, Stanley A. Easton, consulting engineer, and W. L. Zeigler, general manager, all of the Pend Oreille Mines & Metals Company.





California's first successful bucket dredge, Oroville, 1898. Built by Risdon Iron Works, San Francisco. The gentlemen in the foreground are W. P. Hammon and Captain Thomas Couch, who were associates in this dredging venture.

## DREDGING, AN EVOLVING ART

***This article, by a recognized authority in the field, proves dredging is not retrograding but is steadily devising new methods and machinery***

California is celebrating this year a century of gold history. A branch of California's gold mining industry, successful placer dredging is 50 years old, although the first dredge of record in the state (The Phenix) was tried on the Yuba River in 1850. Bucket-line excavating for gravel and mud removal is centuries old, but 1898 marks the successful attempt, near Oroville, of W. P. Hammon and his associates to dredge alluvial gold from California rivers. After that year dredging methods improved rapidly and in less than ten years dredges capable of digging 60' below water level were in use on the Yuba River. Early designers followed the lead of New Zealand dredge builders, but increased depth and capacity soon brought about the so-called California type dredges incorporating a rubber stacker belt, revolving screen and later the solid cast bucket to replace the old built-up bucket of forgings and steel plates.

### ***Dredging, an Important Industry***

The importance of dredging to the state is disclosed by reference to Minerals Yearbook, a U. S. Bureau of Mines annual publication. In fifty years California dredges produced about one-fifth of the gold credited to the state since its discovery 100 years ago. In 1940 ten of the twenty-five

**By Herbert A. Sawin\***

leading gold producers were dredge operators, nine with bucket ladder dredges and one operating a dragline-washing plant unit. Employment was provided within the industry for 2,000 or more people directly concerned with dredging and thousands of others had jobs in factories or plants producing the materials consumed in dredging. Dredges are large consumers of capital goods and power. Their transportation needs and resultant freight charges contribute substantially to railroad and steamship revenues.

Before WPB Order L-208 closed gold mining officially, California had about 45 bucket ladder dredges and 100 dragline outfits working. The former in 1940 produced nearly 415,000 fine ounces of gold and draglines are credited with about 205,000 fine ounces in the same period. Since the war high costs for labor and material have prevented a return to such production and, until gold is revalued

upward, it is probable that many placers will lie idle. When gold prices were changed in a series of upward jumps to \$35 per fine ounce, many placer areas of marginal value were brought into production. Another adjustment of gold value probably would result in further development of known properties and possibly bring about the reworking of many old dredging fields. Such action would provide work for many experienced people in communities where they live and restore to county tax rolls high-value lands which now are carried at only nominal valuations.

### ***Dredging vs. Agriculture***

The discussion of land values is one which goes on endlessly in California. "Dredging vs. Agriculture" is a subject that legislatures, newspapers and vested interests find fertile for political purposes every two years. As long ago as 1913 it was brought up in California's legislature. "Dredging destroys farm land," is the claim of a few who have almost a fanatical interest in keeping the argument alive. Actually, the statement is true in only a few instances, since better than 90 percent of dredging land is comprised of old river channels, benches and bars laid down in the past by stream action. The reconcentration of placer

\* Sales Engineer  
Yuba Manufacturing Company  
San Francisco





This photo of Capital Dredge No. 2 was taken about 1931. It was an 8½ cu. ft. dredge. Originally it was built as Yuba Consolidated Goldfield No. 3 and moved to its Folsom area location from Hammonden where it had been built in 1906. Later it was dismantled again and rebuilt at Biggs, California, as Biggs No. 2. Redesignated each time it was moved and rebuilt, this is a good example of the long life that can be secured from a modern dredge.

gold at lower levels from ancient California rivers which once ran generally northwest to southeast made successful gold dredging possible. The High Sierra block has been elevated in at least three major tilting ground movements. These changed the course of rivers so that new streams flowed out of the Sierra in a westerly direction and cut across old placer gravels at high elevations. The gold particles were picked up and carried downward until streams lost momentum and dropped the gold in great alluvial fans at canyon mouths or in bars and benches as the stream flow changed.

#### Farmers Turn Miners

It was in a modern river, the Feather, that the first successful

dredge worked in 1898. High value of ground as a mine naturally turned river-bank farmers away from crop growing to mining. As the dredging industry progressed it was found that drilling campaigns, carefully carried out and mapped, could develop dredgable placer areas in locations far from modern streams. Usually such land in the Sacramento and San Joaquin valleys, where dredging has been a major industry for fifty years, is poor and suitable only for grazing a few weeks in the spring. It can be called agricultural for that reason, but actually it is hard, gravelly soil and not desirable for crops in competition with finer soils elsewhere in the valleys. Rock-pile debris is unsightly, especially along highways, but dredge-built rock piles them-

selves are valuable. Millions of tons have been crushed and sold for aggregate. Proximity to highways and railroads have made them valuable and such low-value material must be present in large, easily handled volume to make it a marketable product.

Reference to U. S. Census Reports shows that California has available an acreage of crop land standing idle that is equal to one-half the area of approximately 7,500,000 acres that is cropped. Dredging land area in the state is only a small fraction of 1 percent of the good crop land. Despite this fact, which legislatures of the past have recognized, a few people still carry on the fight against dredging at any opportunity. It is one of the problems of mining and not restricted to dredging alone. Almost every state where mining is a major source of revenue has the problem of surface destruction. It goes hand in hand with mining. Rock-pile tailings are evidence of wealth created by dredging in past years; wealth of a permanent nature that has helped to build California.

#### Constant Improvement Sought

During the long period of California's gold dredging history the industry has demonstrated its soundness and resourcefulness. Basic principles today are no different than when the early dredges of 1898 to 1906 were being designed and built. Placer gravel containing gold, platinum or other mineral products, recoverable by dredging, must (1) be dug, (2) be screened, (3) be washed and the metal saved, (4) be disposed of to rock and sand tailings. Thus are set up the primary problems; how they have been met is a story of constant improvement in materials, methods and operating skill. What was once considered impossible has often been accomplished. What may look to be insurmountable today in dredging practice probably will be done in the future. Early dredges weighed a hundred tons or less. Today's great dredges in operating condition displace as much as 4,000 tons. The digging ladder and bucket line on a large dredge might weigh 1,000 tons. The investment for a large dredge alone, without property or royalty costs, can run to nearly \$2,000,000 erected.

#### Good Judgment Needed

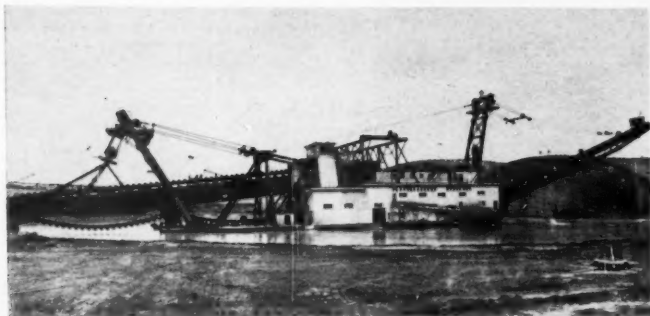
Successful dredging is not entirely mechanical; it involves good judgment by owners and operators. A dredge might be operated profitably in one area but, if moved to another without redesigning or rebuilding to meet new conditions, be a complete failure. Many inexperienced investors hesitate to spend a comparatively small amount of money for prospecting.

One feature of placer dredging not common to many forms of mining is

This Yuba dredge was built in 1940 for the Thurman Gold Dredging Company and is operating near Redding, California. It is equipped with 7 cu. ft. buckets. Its hull is of the portable pontoon type which makes possible relatively easy dismantling and moving to a new area when necessary.







Yuba Consolidated Goldfields Dredge No. 20, Hammonton, California. Displaces about 4,000 tons when working. Has 18 cu. ft. buckets and was designed to dig 124' below water level against a bank 50' high if necessary. It is now equipped with Yuba jigs, having been recently converted from a table type dredge.

the relative simplicity of proving property value, extent and characteristics. Long experience with drills and shafting has developed methods for logging and mapping a gold placer property which make it possible to design a dredge best suited to that property. The presence of boulders, cemented gravel, unusually hard bedrock or other serious conditions can be discovered before a dredge is ordered. Depth of deposit and variations in bedrock elevation dictate the digging ladder length which will work to best advantage. These are physical characteristics to be considered; there are other obstacles which have little place in a technical discussion but which are important. Local laws, such as ordinances requiring resoiling or leveling under zoning restrictions and stream pollution laws, will influence the type of dredge equipment needed. Ponds sometimes must be lowered by pumping and plans made accordingly. The problems in dredging are many. Anyone planning to dredge placer gravel should arrange for a complete investigation by a competent engineer having a background of dredging experience.

#### California Practice

The principle of dredging is quite simple. Good California practice is to dig with the maximum depth reached while the ladder is at 45 degrees with the water level. Digging is started at the top of the bank and, as the bucket line moves upward, the dredge swings about the spud which is at the stern resting on the pond bottom. The spud takes the thrust of digging, distributing the load to the fore and aft trusses. Spring-mounted spud-keepers help in absorbing shocks and distributing the load evenly. The side swinging is accomplished by port and starboard bow lines which are carried from the under-water point of the digging ladder to shore blocks and

back to the bow of the dredge on the forward deck, thence to the swing winch, usually mounted inside the deck house on the starboard side. As one drum of the winch takes up the line, say on the port side, the other pays out a slack line to the starboard. As the swing is completed the operation is reversed.

#### Amalgamation and Jigs

Material after it is dug is elevated to the main hopper and is sized in a revolving screen which discharges over-sized rock and gravel to a rubber stacker belt. This rock and gravel is stacked in a pile and form the rock tailings which can be seen in parts of California. Fines (usually minus 1/2-inch) are passed through the screen perforations to gold-saving tables equipped with Hungarian riffles with mercury trap riffles, usually used in the ratio of 4-1. Free, clean gold readily amalgamates with quicksilver. Dredges are "cleaned up" weekly, amalgam and heavy sands are taken ashore for final treatment.

There is endless discussion concerning gold losses which occur with the discharge of fine tailings overboard from tail sluices. On a well-designed and operated dredge mining clean placer gold which amalgamates freely, it is possible that losses are less than the cost of additional equipment and labor to save them. Modern practice includes the use of jigs of one type or another and they have been installed on several dredges, either used as a complete recovery system or in conjunction with tables and riffles. Jigs have been used on California dredges since about 1914, when Neill jigs were tried. At least one dredge today still uses Neill jigs. Others are using Bendelari, Pan-American and Yuba jigs. Amalgamators and other mechanical devices are needed on jig-equipped dredges

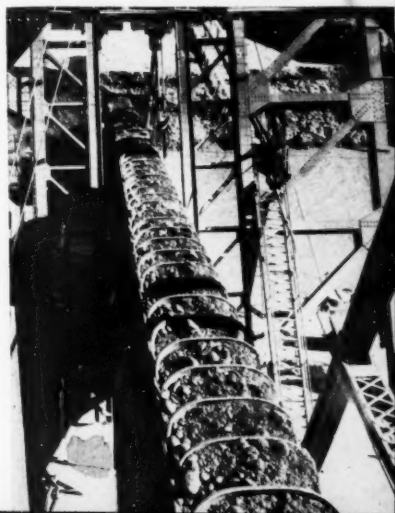
and extra men required to operate them.

Progress made in California has been adapted to dredging fields in other parts of the world. Space does not permit a detailed account of the many early operations, but by 1913 bucket sizes had reached 13 1/2 cubic feet capacity on Yuba River dredges operated by Yuba Consolidated Gold Fields. Later these were increased in capacity to 15 cubic feet and then 18 cubic feet each. Digging depths of 60 feet were once thought to be maximum, but now two dredges in California dig 112 feet and 124 feet below water level and against banks 50 feet high if necessary. These dredges have monitors forward and high-pressure pumps to supply water needed for sluicing down high banks or old rock, the latter case when working through old tailing piles.

#### Effects of Pegged Gold Price

Dredging is only one form of gold mining which suffers from a fixed price ceiling. Obviously, the price of \$35 is too low in the face of higher operating costs resulting from inflated prices prevailing in every market where the gold miner must purchase supplies and equipment. The price ceiling could be adjusted upward to conform with free gold markets existing elsewhere. Gold miners could be permitted even to offer their new gold on the open market to the highest bidder instead of being required to deliver it to the government at \$35 per fine ounce. Any action taken to correct the price of gold will react almost immediately in favor of California dredging.

Yuba Consolidated Goldfields Dredge No. 20 bucketline. This photo was taken from the winchroom of the dredge. Buckets and lips are of manganese steel, the bucket pins of forged nickel chromium steel, heat treated. The gravel seen in the buckets is typical of the Hammonton area where most of the alluvial material was washed down from Yuba River canyon points.





Typical miners with a car of mica at the mouth of a tunnel in the mining region in the heart of the continent down under. The men seldom stay longer than necessary to accumulate enough to give them a start in some other business as the life is extremely rugged in the mica camps.

By John Loughlin  
Australia

## IMPORTANT FIND OF BOOK MICA REPORTED IN REMOTE AREA OF CENTRAL AUSTRALIA

News of the discovery in the desolate heart of Australia of the finest mica yet found in this country has been brought back by a government official.

Returning from a periodical visit to Australia's only mica field in the remote Hartz Range region, 140 miles northeast of Alice Springs, William Turnbull, manager of the government mica pool, reported that the find supported high estimates by mineralogists of the importance of the Central Australian deposits.

### Multiple Uses

Its universal use as insulation in war equipment and in electrical and radio industries generally, and the fact that it is mined in few parts of the world, give mica the status of a strategically vital mineral.

Mica, resembling film in appearance, is used in its highest form in transformers, armatures, radio tubes, and in condensers. Lower-quality mica is widely used in heating elements and terminal insulation for domestic electrical equipment. Windows for furnaces, eye-pieces for gas masks or goggles, and covers for instruments and steam gauges may be made from mica.

### War-Time Shortage

A world shortage of the mineral during World War II turned Australia's attention to its own deposits. The Commonwealth mica pool was

organized to encourage the exploitation of the Hartz Range field. So harsh is life on the field, however, that many of the miners have left, and today barely a hundred remain, working independently or in syndicates.

Sample "books" of high grade mica brought from the scene of an important "find" in Central Australia where Australia's only mica deposits are being worked in the Hartz Range area. A cutter begins the splitting of the "books" into thousands of sheets.—Australian Official Photo.



[World Mining Section—16]

MINING WORLD

## INTERNATIONAL

It is on the Plenty River section of the field—a new area so far barely scratched—that mica of the highest known grade has been found by one miner. Samples brought back by Mr. Turnbull were large blocks (or "books") of clear, hard ruby mica—the blocks split into thousands of transparent, flexible sheets. The blocks were valued at around £500 each.

### Important Resource

Mica is classified according to freedom from stains or flaws, and size of flawless sheets left after trimming. Highest grading is for sheets of over 100 square inches ("over extra extra special" is the grading). More than half of the Australian production is in sheets of three to six square inches, but the blocks from the Plenty River deposits provide clear, flawless sheets of from 200 to 270 square inches.

This mica, which is earning the miners £8 a pound, will be reserved for scientific research equipment.

According to a survey of the field just completed by Dr. J. A. Dunn, government mineral economist, mica is probably the most important single natural resource of Central Australia awaiting development.

Dr. Dunn compares the Hartz Range field in size with the great Bihar mica belt of India, which supplies 80 percent of the world's better-quality mica, and he claims that the average quality of the ruby mica from Hartz Range is higher than that from India.

### Extensive Field Indicated

Most of the men working the field are Italians, or are of Italian descent. They are earning good money—as much as £1,500 a year tax free—but living conditions are so arduous that few men are attracted to the field. Remote from civilization, in otherwise uninhabited territory, they live, some with their families, in tents or rough stone huts roofed with sheet iron. Water from bores is carried to the outlying mines from a government depot for 2/d per 100 gallons.

According to Dr. Dunn, only about three of the 25 workings on the field at present could be regarded as mines in the strict sense. Most of the mining up to the present had been little more than prospecting and removal of easily-worked surface mica. The deepest mine was only about 100'.

At the time of his survey, Dr. Dunn said, no very large sizes such as those

found from time to time in other countries, had been seen at Hartz Range, but the field had been only scratched so far. He reported optimistically on the quality of the mica at the Plenty River area, where the latest find has been made.

The total annual production of mica was down to 600 to 1,000 cwt. of block mica. Labor shortage, and the remoteness of the field, were the two main difficulties involved in systematic development of the deposits. The rail distance from Alice Springs to Adelaide, the main center in the South, was nearly 1,000 miles.

### Present Exploitation Insufficient

Dr. Dunn's conclusion is that the present methods of exploitation by small miners can never give rise to a worthwhile industry, nor even yield any substantial increase in output. Establishment of a sound industry with sufficient output for export would depend on the development of a large number of mines by a strong company, with capital of about £750,000.

Dr. Dunn has recommended the creation of a modern settlement of 1,000 people on the field with homes designed on tropical lines, schools, shops, hotels and recreational facilities to compensate for the rigors of the country. Only thus, he has emphasized, can Australia exploit its valuable deposits successfully.

### Tin Operators in Siam Gaining in Production

At the end of World War II, the tin operators in Siam were faced with the problem of getting their mines back into production after a long period of inactivity. Necessary capital was lacking, but not so determination.

Realizing that immediate production meant revenue and employment, the government took the first step toward rehabilitation by drawing up an international agreement whereby large stockpiles accrued during the Allied blockade would be allocated to several countries on a percentage basis. From those receipts, Siam has now compensated tin owners in the amount of £1,250,000, which represented the 1941 price of the ore, less operating costs.

Following this payment for ore removed during the occupation, there still remained the need for additional capital by the tin owners to commence operations. The government, therefore, furnished the companies with rehabilitation advances, based on estimates of future compensation claims. These payments were started

last year, and claims are being accepted until March 31, 1949.

According to Khun Vichan, acting director of the department of mines, rehabilitation efforts resulted in the production of 354 metallic long tons in July, 1948, as compared with 1,831 tons in 1941. Ten of the 41 prewar dredges are now in operation, and present estimates set production at three-quarters of its prewar level by the end of next year.

Producing companies include: In Ranong province, Bangrin Tin Dredging Company, Ltd., two dredges, and Siamese Tin Syndicate, Ltd., two dredges; in Phangnga, Takuapa Tin Dredging Company, N. L. and Siamese Tin Syndicate, Ltd., two dredges; in Phuket, Katu Tin Dredging, Ltd., and Kamra Tin Dredging, Ltd.; in Songkhla, Takuapa Tin Dredging Company, Ltd.

Included among those companies rehabilitating dredges are: In Ranong, Siamese Tin Syndicate, Ltd., Bangrin Tin Dredging Company, Ltd., Renong Consolidated Tin Dredging Company, Ltd., and Tongkah Compound Number Three; in Surat Thani, Siamese Tin Syndicate, Ltd.; in Phangnga, Kamunting Tin Dredging, Ltd. (Pangnga River Tin Concessions), and Krasom Tin Dredging, Ltd., which is now under new ownership.

William Turnbull, manager of the Australian Government mica pool, displays a large "book" of mica of the highest quality so far found in Australia. Valued at £8 a pound, it is worth about £500. This block will yield sheets of flawless mica 270 square inches in area, compared with the average in Australia of three to six square inches.—Australian Official Photo.



# RHODESIA ADVANCES GOLD PRICE

***This increase in gold price brings greater tonnages within range of operators if government puts a ceiling on wages and supplies***

Important events during the month of May were the increased price of gold from £8-12-6 per fine ounce to £10 per fine ounce; and the election of the Nationalist Government in the Union of South Africa—the influence of the former is purely domestic Rhodesian, but the repercussions of the latter are international.

The decision of the Southern Rhodesian government to pay £10 per

## By "Miniscus"

fine ounce for Rhodesian produced gold is a much needed stimulus, which some engineers feel they may be too late to revive effectively an industry which has shown a declining production for the past few years, and may be in a crippled condition.

Production figures for March, 1948,

are 326 ounces less than February, 1948, and 4,093 ounces less than February, 1947—this, to a country with a European population of less than 100,000, is alarming. The number of active producers has fallen below the 300 mark and of these, 20 mines are responsible for 59 percent of the gross output of 40,880 ounces for March, 1948.

Fortunately, nature favors a balanced state, and it is pleasing to learn that base mineral production in January, 1948, had totaled £356,000, an increase of £90,000 over the previous month, and an increase of £122,000 over the corresponding period in 1947. Base mineral production is now fairly close to being on a par with precious metals, and indications are that precious metals are being left behind in the rapid growth of the base mineral industry. Chrome, coal and asbestos are the principal items in the base mineral production schedule, with chrome and asbestos having the additional advantage of being foreign exchange commodities—an incalculable feature in present day trade arrangements with the United States.

## What the New Gold Price Means

Before the ore reserve position is readjusted as a result of the recent price increase, it is well to examine the production cost figures.

While the government has decided to pay the increased price for gold, no mention is made of pegging prices of commodities. Unless a realistic attitude is taken in this matter it will be found that the increased price of gold is soon offset by the corresponding rise in basic mining material requirements such as steel joists, rails, drill steel, machinery and equipment, as well as consumable stores. The solution then would seem to be that of pegging prices at their average level on the day the increased price of gold was announced. Prices having been pegged for all commodities, wages will tend to remain relatively steady with no mass demands from the trade unions

TABLE A

### Representative Factors for the Gold Mining Industry

Working cost per ton.....	27 shillings or \$5.40 approximately
Waste sorting, say.....	10 percent
Value of waste, say.....	0.5 dwt. per ton or 0.87 approximately
Mine call factor or assay plan factor.....	85 percent
Residues, say.....	0.4 dwt. per ton or 0.70 approximately
Flue losses in roasting.....	0.2 dwt. per ton or 0.35 approximately
Old price of gold.....	£8-12-6 per fine ounce or 34.50 approximately

TABLE B

### "Old" Pay Limit Calculations

Working costs in terms of dwts. =

$$\frac{27/-}{£8-12-6} \times \frac{20}{1} = 3.13 \text{ dwts. or } \$5.48 \text{ approximately}$$

Recovery = 3.13 dwts.

Residues = 0.40 dwts.

Roasting losses = 0.20 dwts.

Total 3.73 dwts.

$$\text{Grade of ore mined} = \frac{3.73\%}{85} = 4.39 \text{ dwts. per ton or } \$7.68 \text{ approximately}$$

Tonnage milled..... 900 @ 4.39 = 3951.00 or \$6,914 approximately

Tonnage sorted..... 100 @ 0.50 = 50.00 or 87 approximately

Total..... 1,000 @ 4.001 = 4001.00 or 7,002 approximately

TABLE C

### "New" Pay Limit Calculations

$$\text{Working costs in terms of dwts} = \frac{27/-}{£10} \times \frac{20}{1} = 2.7 \text{ dwts. or } \$4.72 \text{ approx.}$$

$$\text{Grade mined} = \frac{(2.7 + 0.4 \div 0.2)}{85\%} = 3.88 \text{ dwts. or } \$6.79 \text{ approximately}$$

900 × 3.88 = 3492.00 or \$6,111 approximately

100 × 0.50 = 50.00 or 87 approximately

1,000 × 3.542 = 3542.00 or 6,198 approximately

or 3.54 dwts./ton pay limit

6.19 approximately



# You Get "Plus Performance" with EUCLIDS



(Above) Model TD Rear-Dump Euclid. 22 ton capacity... 14.8 cu. yds. struck measure... loaded top speed 31.2 m.p.h.... powered by 225 or 275 h.p. diesel engine.

(Below) Double-acting twin hoists and entire hydraulic system are of Euclid design and manufacture. Action is fast and positive enabling operator to control body position at all times.



**R**EAR-DUMP EUCLIDS are engineered and built for lasting strength. Their ability to stay on the job, day after day, means more tons moved at lower cost... "plus" performance for owners.

Model TD Euclid body has extra thick plates reinforced with heavy box section side and bottom supports. The rugged frame is built to stand the jolts of hauling 22-ton loads. That's why it can take the pounding and wear of loading ore, coal, overburden, and heavy excavation by large shovels and draglines.

Some other "plus" features that make the Model TD Euclid unequalled for long-life and continuous performance are large capacity... ample power and traction for steep grades and tough roads... good speed on the haul road and full-floating, double reduction planetary type Euclid axle.

If you want economical operation and equipment best suited to your hauling needs, see your Euclid distributor or representative.

The EUCLID ROAD MACHINERY Co. Cleveland 17, Ohio



# EUCLIDS



*Move the Earth*





for all-round increases, thus making the gold price increase a reality.

On the pegged-price basis it is safe to assume the following figures in Table A as representative of the Southern Rhodesian gold mining industry.

The figures set forth in Table B indicate the returns from an orebody of an assumed valuation at the "old" pay limit calculation.

At the old price of £8-12-6 (\$34.50) per oz. a grade of 4.0 dwts (\$7.00) per ton would, therefore, give no-profit no-loss figure, i.e., a pay limit.

Under Table C is outlined the results of an assumed valuation at the "new" pay limit calculation.

The pay limit, therefore, under the increased price improves by 0.46 dwts (\$0.805) per ton, which in itself will bring many thousands of tons within payable ore reserve blocks.

This, however, is insufficient; what is required, is that Britain and America should reconsider the Bretton Woods Agreement, where they fixed gold at \$35 per ounce, and increase same to \$60 per ounce if the small gold mines of the world are going to be saved.

### New Gold Producers

Southern Rhodesia places great hopes on the Motapa (Goldfields Rhodesian Development Co.), the Connemara (Frobisher Exploration) and the Dalny (Falcon Mines, Ltd.). Of these, the Connemara is already producing at the rate of 812 ounces per month according to March figures. Full scale production for the Connemara should see this figure trebled.

The Motapa has a well developed ore reserve and the metallurgical plant is in the final stages of completion. The Motapa plant includes two 56 rabble Edwards roasters. Production figures should be available in the near future.

The Dalny mine is busily engaged developing an ore reserve.

A possible combined production of 2,000 tons of gold ore per day from these three mines would go a long way towards swelling Southern Rhodesia's rather lean gold field—at the present moment an all time low within the living memory of most mining men in Southern Rhodesia.

### Brazil Anxious to Ship U. S. Iron and Manganese

Dr. Jose Garrido-Torres, director of the Brazilian Government Trade Bureau, announced recently that Brazil will be willing to supply the United States Steel Corporation with 200,000 tons of manganese and 500,000 tons of iron ore annually, but first she must improve transportation facilities, docks and harbors, and obtain additional mining equipment.

The Brazilian official made these comments in response to a statement made in Rio de Janeiro by Benjamin F. Fairless, president of United States Steel, in which the latter said he hoped to arrange for shipments of iron ore and manganese from Brazil either on a dollar-payment basis or in exchange for United States coal.

Brazil's iron ore reserve has been estimated at a minimum of 15,000,000,000 tons, Garrido-Torres said, and is thought to be the largest in the world. Brazil's manganese reserves, as surveyed so far, amount to more than 40,000,000 tons, which may be a conservative estimate.

Both the iron and manganese are of better grade than United States ore, according to Garrido-Torres, who said the manganese is generally 50 percent pure, while much of the iron ore contains 69 percent iron.

### Uranium Rush of '49 Expected in Alaska

Prompted by the \$10,000 bonus offered by the AEC for locating a sizable deposit of uranium, Alaskan prospectors have discarded their gold pans and sluice boxes to take up the search for signs of pitchblende, gumite, carnotite and other uranium-bearing minerals.

B. D. Stewart, territorial commissioner of mines, said his offices have been besieged by prospectors seeking information on uranium, and AEC prepared pamphlets giving methods of locating and recognizing radio-active ores are now being distributed.

Stewart further said that he expects the real stampede, reminiscent of the gold rush days of '98, to begin next summer when the prospectors have assembled their gear and become more familiar with the aspects of locating atomic material.

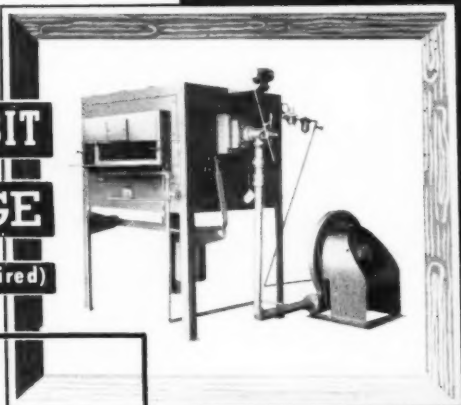
The presence of uranium-bearing minerals has been known for many years in several areas of northwestern Alaska, having been discovered in the quest for gold. Recently, new deposits were found less than 100 miles from Nome, while others have been located just across the Bering Sea from Siberia.



# ROCK BIT

# FORGE

(Oil or Gas Fired)



- Ideal for any heating operation involving detachable rock bits.
- Extremely useful as a general purpose shop furnace.
- Efficient performance at any temperature to 1900° F.
- Uniform temperatures throughout roomy 28" x 24" hearth.

WRITE TODAY FOR  
BULLETIN DB-1

The  
**DENVER FIRE CLAY**  
Company  
EL PASO, TEXAS NEW YORK, N.Y. SALT LAKE CITY, UTAH  
DENVER, COLO., U.S.A.

## PROMINENT MEN IN INTERNATIONAL MINING

*J. V. Lake* has been appointed mine superintendent for Ballarat South Goldfields N. L., Victoria, Australia.

*G. Fisher*, general manager of Zinc Corporation, Ltd., Broken Hills, New South Wales, has been appointed to the new board of directors of Sulphide Corporation, Ltd.

*Professor J. A. S. Ritson* was recently re-elected president of the Institution of Mining Engineers in England for another year.

*G. F. V. Anderson* has been appointed mine superintendent at Big Bell mines in Western Australia.

*W. B. Milner* and *D. M. Hogarth* have been elected to the board of directors of Nicholson Mines, Ltd., Toronto, Ontario. Milner assumes the presidency, and *C. H. E. Stewart*, who was president, has been appointed vice-president and general manager.

*Dr. Lewis E. Young*, consulting mining engineer of Pittsburgh, is the new president of the American Institute of Mining and Metallurgical Engineers. Elected at a board meeting in New York, he will take office at the institute's annual meeting in San Francisco in February.

*Louis Ware* was re-elected president of International Minerals and Chemical Corporation at the recent annual stockholders meeting in Chicago. Other officers were also re-elected, including: *Robert P. Resch*, vice-president and treasurer; *Franklin Farley*, vice-president in charge of the phosphate division, and *A. Norman Into*, vice-president in charge of the potash division.

*Harlowe Hardinge*, president of the Hardinge Company, Inc., of York, Pennsylvania, has received a government appointment to the Mining Machinery Manufacturers' Industry Advisory Committee. The committee will determine the practicability of a voluntary plan to provide the mining machinery industry with steel products.

*J. E. McMyyn* has resigned as assistant mine superintendent of The Granby Consolidated Mining, Smelting and Power Company, Ltd., to join the engineering staff at the Sullivan mine of the Consolidated Mining and Smelting Company of Canada, Ltd. He is succeeded at the Copper Mountain mine by *J. A. C. Ross*.

*W. H. Smith* has joined the staff of Renabie Mines, Ltd., Toronto, Ontario, as chief engineer, succeeding *A. G. Ormerod*, who has resigned.

*F. H. Chapman* has resigned from

the staff of The Consolidated Mining and Smelting Company of Canada, Ltd., at Trail, British Columbia, to accept a position with the Association of Professional Engineers of British Columbia in Vancouver.

*Donald B. Angus* has been appointed manager of Central Patricia Gold Mines, Ltd., Toronto, Ontario, succeeding *R. E. Barrett*, who has resigned to become a professor of mining engineering at the University of Toronto.

*P. S. Cross*, formerly manager of Miles (Red Lake) Mines, Ltd., Toronto, Ontario, is now geologist with Renabie Mines, Ltd., at Missanabie, Ontario.

*Sydney E. Taylor*, president of the Institute of Mining & Metallurgy, London, has been made an honorary member of the Canadian Institute of Mining and Metallurgy.

*Viga Streshthaputra*, geologist with the Royal Department of Mines at Bangkok, Siam, was a recent visitor to a number of large open-pit operations on Minnesota's Mesabi iron range.

*John Q. St. Clair*, diamond drill specialist of Johannesburg, South Africa, has been visiting his father, *George H. St. Clair*, diamond drill contractor on the Mesabi Range of Minnesota.

*R. W. Diamond*, vice-president and general manager of The Consolidated Mining and Smelting Company of Canada, Ltd., Trail, British Columbia, has been awarded the Julian C. Smith medal of the Engineering Institute of Canada for achievement in the development of Canada.

*James Sweet*, mining engineer, recently returned from Northern Rhodesia and is now connected with the Tungsten Mining Corporation at Henderson, North Carolina.

*James H. Pierce* of Pierce Management, Scranton, Pennsylvania, recently returned to the United States from China, where he assisted in mapping out a mining program for the National Resources Commission of China.

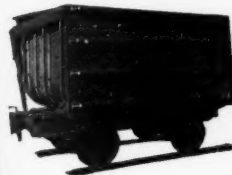
*M. R. Keyes*, formerly geologist with Berens River Mines, Ltd., Winnipeg, Manitoba, is now on the Newmont Mining Corporation staff at Winnipeg.

*MacLeod White*, who resigned recently as resident manager of the Yukon Consolidated Gold Corporation at Dawson, Yukon Territory, is residing temporarily in Vancouver.

# CARD CARS



For "Lowest Cost per Ton Mile Haul"



In the final showdown, LOWEST COST PER TON MILE HAUL, is the stake you are playing for.

Why not standardize on CARD CARS! From Cobalt to Sonora, practical mining men say "Every Card Car is an ACE in the hole."



DESIGNED AND BUILT TO BEST MEET SPECIFIC CONDITIONS IN EACH MINE.



Ask for Catalog 40

**C.S. Card Iron Works Co.**

Denver, Colorado



## AFRICA

**SOUTH AFRICA**—Base metal and mineral production is making steady progress in northern Transvaal, and pegging of new ground has increased extensively, particularly in asbestos and copper. In the case of the former, the 60-mile long field in the Drakensburg Range has been fully pegged, while nearly all available copper ground in the Messina area and along the Murchison Range has been pegged. In addition, some 10 miles has been covered by new peggings on the antimony belt. Production figures for the area in 1948 were: Copper, 11,800 tons and asbestos, 5,300 tons.

**MOROCCO**—Two new companies are being formed to carry on exploration activities for copper in the Ouarzazate region of southern Morocco. At present, copper ore is being mined at the *Azegour* and *Gundafa* properties situated in the Haut-Atlas of Marrakech. A plant for the manufacture of copper sulfates was recently completed at Casablanca.

**SOUTH AFRICA**—The increasing scale of chrome mining in the Transvaal is reflected by *Palmiet Chrome Mines* which started production from two of its reefs during the past year. Although a substantial tonnage of lumpy friable ore has been mined from these reefs, the quantity of ore is inadequate for the tonnages required. Consequently, a diamond drill program has been undertaken in the hopes of supplementing present tonnages. Work on a 100-ton gravity concentrator also is under way. D. A. B. Watson is consulting engineer.

**FRENCH WEST AFRICA**—Construction of a dam and reservoir and hydro-electric works on the threshold of Guinea on the Senegal River is planned. Dredging will make a permanently navigable river, and electrification of railway facilities from Dakar to Nigeria will allow creation of a chemical plant to treat local phosphates.

**SOUTH AFRICA**—A provisional amalgamation agreement made by directors of *City Deep, Ltd.*, and *Nourse Mines, Ltd.*, two long-established companies operating on the central Rand, has been confirmed by shareholders. Substantially all of Nourse's ore is at depths approaching 8,000' in a strike length of 3,000', adjacent to City Deep's boundary. As workings are reached only by traversing a vertical and three sub-

incline shafts, mining costs are extremely high, and a new shaft is unwarranted because of the small strike width. City Deep's No. 5 shaft is conveniently situated to serve this area, and its mill has not been supplied to capacity for some time. This situation, coupled with shortages of labor and materials, has prompted City Deep to offer 391,832 shares at £1 each in return for Nourse's holdings. G. V. R. Richdale is City Deep's chairman, and P. H. Anderson is Nourse Mines head. P. J. Louis Bok is Nourse Mines manager.

**SOUTH AFRICA**—At Johannesburg, the stock exchange is reported to be booming as never before, following the entry of new industries from Britain and the United States and new gold discoveries east of the Witwatersrand field. Value of stocks quoted on Africa's Wall Street has topped £1,000,000,000 (more than \$4,000,000,000), over three times the prewar record of £325,000,000 on December 1, 1938. The *Odendalsrust* gold finds are said to be largely responsible for the boom. Although the gold lies unusually deep and is not being worked as yet, assays as high as 1,600 dwts. gold per ton are claimed.

**WEST AFRICA**—*Nanwa Gold Mines* has purchased machinery and equipment from the giant Bibiani property, and after some adjustments, Nanwa's plant is expected to handle 12,000 tons monthly. Production is expected to get under way in the fall. Nanwa is satisfied that it has a good deal. If the plant had been ordered in England, the expense would have been greater, and delivery might have taken as long as two years.

**FRENCH EQUATORIAL AFRICA**—Studies are reported to be under way for the treatment of zinc, which is known to exist in substantial deposits in the middle Congo. More than 5,000 tons of lead ore are mined annually in this region.

**SOUTH AFRICA**—Blyvooruitzicht, one of the most phenomenal mines in the history of the Rand, has reported a net profit of £2,486,519 (nearly \$10 million) in its sixth year of operation. Situated on the southwestern extension of the Witwatersrand, the mine started operations in February, 1942, and since then has produced 1,071,429 oz. of gold from 1,474,701 tons milled. Notwithstanding the occurrence of large volumes of underground water, necessitating cementing in both development and stoping, the milled tonnage rose from 121,209 in 1942-1943 to 525,000 in 1947-1948. Plant capacity was increased to 80,000 tons monthly during the past year, with a further extension to 120,000 tons now planned. B. A.

Kinahan, consulting engineer, states that during the past year 13,850' was sampled on the Carbon Leader reef, the property's chief gold carrier, all of which was payable at an average grade of 60.3 dwt. per ton over 11". During the same period, development totaled 31,943', increasing ore reserves to 6,043,000 tons at an average value of 13.8 dwt. per ton. Installation of a hoist with eight-ton capacity skips has been started at the No. 1 shaft.

**SOUTH AFRICA**—*Luipaards Vlei Estate and Gold Mining Company*, one of the Rand's newer producers, has achieved a decline in working costs per ton, due mainly to the increased tonnage handled which was made possible by extension of its metallurgical plant. The company is carrying out development work both in the upper and lower levels of the mine: A winze being sunk from the surface to the 4th level will enable further development on the Montana reef, while the incline haulage has been advanced to the 43rd level to enable development of faulted ground in this area. A 50-drill compressor was recently installed, and another 150-drill compressor is expected to be operating at the end of the year.

**BELGIAN CONGO**—A new radioactive mineral was discovered recently in the Belgian Congo and identified in the geology laboratories of Columbia University as a hydrous copper uranium vanadium mineral. The new mineral has been named "sengierite" in honor of Edgar Sengier, executive director of the Union Minière du Haut Katanga, in recognition of his efforts in directing wartime mineral production in the Congo. It is similar to carnotite, except that it is a copper-uranium mixture, while the Rocky Mountain mineral consists of potassium and uranium.



## ASIA

**JAPAN**—Negotiations have been completed by the China Mutual Importing Company, Seattle, for the shipment of 250,000 tons of iron ore to Japan. The ore will be taken from Texada Island, 65 miles north of Vancouver, British Columbia.

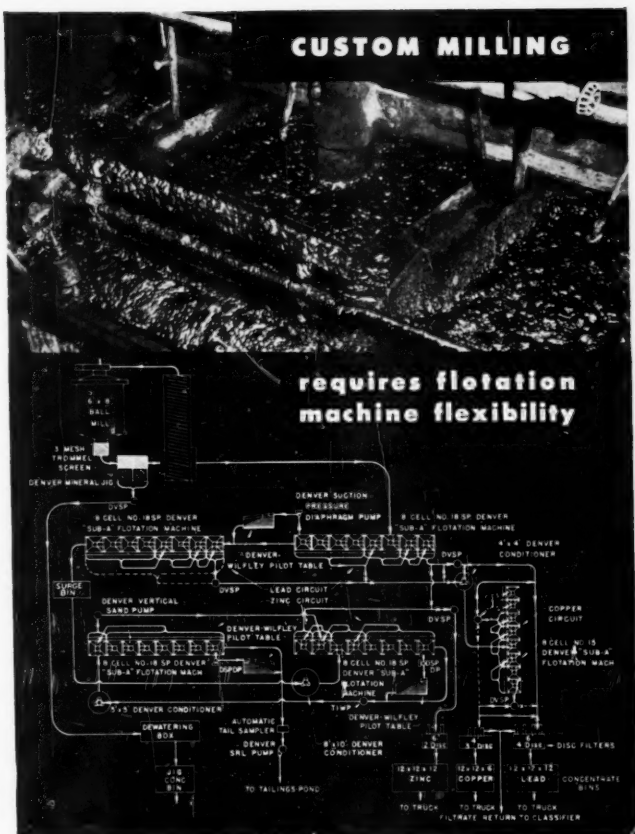
**MALAYA**—Substantial British, Canadian and American interests are reported to be prospecting for bauxite in the whole Malayan peninsula, although no actual mining operations have been carried on since the surrender of the Japanese. During the war, the Japanese produced about 600,000 tons of bauxite on the Malayan mainland. Now, with the

## Using Denver "Sub-A" Flotation Machines

... The American Zinc, Lead and Smelting Company at Ouray, Colorado, serving mines of the San Juan Triangle, are able to economically treat a wide range of complex ores in this 225-ton-per-day Denver Built Custom Mill.

**FLOTATION FLEXIBILITY** is the key to successful recovery of the many minerals treated. Any Denver "Sub-A" Flotation Cell, singly or in a bank, may be used as a rougher, cleaner, re-cleaner, or even as a conditioner, giving selective high-grade concentrate with low tailing.

**COARSE MATERIAL** (up to 1/4") may be fed from any quadrant, with no short circuiting of pulp. Accurate pulp level is easily maintained. Middlings are recirculated by gravity without use of pumps. Air and/or gas can be admitted under positive control to any Denver "Sub-A" Flotation cell.



**PRINCIPAL ORE MINERALS**, recovered at this American Zinc Custom Mill by Denver "Sub-A" Flotation, cover a wide range and may vary considerably from hour to hour. These include:

GALENA  
SPHALERITE  
CHALCOPYRITE  
MARMATITE (ZnFeS)  
ENARGITE (Cu<sub>3</sub>AsS<sub>4</sub>)

**GRAY COPPER** (copper, arsenic and antimony sulfides usually containing silver).

**GOLD AND SILVER BEARING PYRITES.  
COMPLEX BASE METAL SULFIDES.**

**You may read the complete story of this custom milling operation in Deco Bulletin M4-B51. Write for your free copy.**



*"The firm that makes its friends happier, healthier and wealthier"*

**DENVER EQUIPMENT COMPANY**  
P.O. BOX 5268 • DENVER 17, COLORADO

DENVER • NEW YORK CITY • CHICAGO • TORONTO • VANCOUVER • MEXICO CITY • LONDON • JOHANNESBURG • RICHMOND, AUSTRALIA



## A Great Team FOR REDUCING SLUSHER COSTS!

### SPECIALLY ENGINEERED BLOCKS AND BUCKETS

Did you know that cable costs run over a cent per ton for each ton of ore or rock handled? It all adds up if you use a foot of cable for every 5 to 10 tons ore handled!

### THE ROPEMASTER

Because of proper design and balance this properly balanced RopeMASTER will follow the movement of your cable, giving better results.

There's a RopeMASTER for every job—one trial and you'll be convinced it's your best buy!



### CATE SCRAPER

Now, even more advanced scraper design in Cate's next largest and newest sized scraper to be offered mining profession. This 28 inch scraper is built for colliery.



Outrigger arms take on true appearance of a wishbone. Renewable, removable blade.

Lowest Priced Steel Scraper  
On the Market Today!

**Cate**

**EQUIPMENT CO.**  
49 EAST 9th SOUTH  
SALT LAKE CITY, UTAH

rapidly rising demand for aluminum, currently below world requirements, development of Malaya's bauxite would be a welcome supplement to her tin production, demands for which may be reduced because of the present excessive price.

**INDO CHINA**—Mining activities are showing a revival only equal to motions made toward peace, dubious progress. The tin and wolfram mines of Tonkin, in the region of the Pia Ouac (freed in October 1947), show a very slight recovery, while the tin mines of Laos, situated in a zone of relative security, remain inactive because of transportation difficulties and shortage of manual labor. Some rehabilitation, however, has been effected at the latter properties. Remaining in zones of insecurity are the zinc mines of Cho Dien, the gold properties of Bong Mieu and the vast deposits of apatite at Iao Kay, near the Chinese border.

**IRAN**—A plan to establish a Persian iron and steel industry at an estimated cost of £3,500,000 has been announced at Teheran. The plant will be built at Teheran, and rails, structural forms and sheets will be produced to replace prewar imports, which amounted to between 40,000 and 70,000 tons yearly. Final decision to go ahead with the construction, which will take from five to seven years, will depend on the proving of a sufficient coal supply of suitable quality.

**JAPAN**—Although gold mining is practically negligible in Japan today, an encouraging note has been struck with the reopening of the Konomai mine in Hokkaido. One of the best gold mines in Japan, the Konomai covers 31,600 acres and is reported to have about 1,090,000 tons of proved ore. Permission to reopen was granted the Seika Mining Company, Ltd. (formerly the Sumitomo Mining Company) last April by the GHQ and Japanese government. Reconstruction of the 400-ton capacity cyanide plant, temporarily suspended because of severe cold weather, is scheduled for completion by March, 1950. Construction has been slow because of a materials shortage, and wood framework instead of steel has required much time and labor. Upon completion, the mill is expected to produce 770 kg. gold and 11,925 tons of silver annually, assuming the ore will contain 7.15 gr. gold and 124.5 gr. silver per ton. This is about one-third of the 1940 peak production. Machinery and equipment, which have been kept by the company since the mine's closure in 1943, are reported to be in workable condition, making new purchases unnecessary. Nevertheless, the funds necessary for completion of the mill are estimated at more than \$500 thousand. Muneji Sato is mine director,

and Sotoji Tanaka heads the Seika company, Kitahama 5-22, Higashiku, Osaka.



**EUROPE**

**FINLAND**—A new phase of operations has begun at the Orijarvi, Finland's oldest base metal mine, controlled by the Outokumpu Company. Since 1757, when the orebody was discovered, it has produced mainly copper. Now, however, lead and zinc also are being produced. At present, underground operations have been limited to development work only, while feed for the concentrator is obtained from old surface dumps. About 300,000 tons of ore is said to be available in these dumps, averaging about 1 percent copper, 1 percent lead and 3 percent zinc. Although the dump ore is badly oxidized, plant tests have given encouraging indications of economical treatment. On the basis of 150 tons, now being treated daily, the dumps are expected to provide feed for six or more years.

**ENGLAND**—At the Geevor tin mine at Pendeen, near Penzance, installation of additional tables and a ball mill is planned. Development work at the property is said to be reported satisfactorily, and mill recovery, which has improved in recent months, is around 80 percent in spite of the fact that the cassiterite is mainly under 150 mesh. The plant is operating 16 hours daily under the management of J. Herbert Bennetts.

**POLAND**—A tunnel connecting the Nova Helena zinc-lead mine and the Helka shaft has now been reopened, and large-scale operations are expected to be resumed in the Helka field.

**ROUMANIA**—An exceptional gold ore discovery is reported from the Twelve Apostles mine at Ruda, Transylvania. This district, whose mines were operated by the Roman emperors in the Second Century A. D., is recognized as having the richest gold occurrence in Europe.

**BULGARIA**—Considerable quantities of copper ore are reported to have been found during exploration, now under way in the vicinity of the Plakalnica copper mines. Ore of three to 3.5 percent copper had been mined at the Plakalnica mines from 1910 until it was exhausted.

**ENGLAND**—It is reported that Constables (Matlock Quarries) Ltd., operating the King Masson fluorspar mine at Matlock, County Derbyshire, will increase its mill capacity. The spar is being mined by open pit methods and is treated in jigs supplemented by table-flotation for the production of higher grade granular fluorspar. J. W. Hobday is manager.



## INTERNATIONAL

**YUGOSLAVIA**—Five hydro-electric plants have been completed on the Drau River, and four more are now under construction which will give a total capacity of 100,000 kw. Around these plants is growing a large industrial district that includes the aluminum reduction plant of Strnischche and several copper electrolytic plants. The Strnischche plant, now under construction, will have a capacity of 30,000 tons of pig aluminum annually. Construction was started by the Germans during the war, but suspended in 1943. Bauxite for the new plant will be shipped from the mines of Istria, detached from Italy by the Italian peace treaty.

**AUSTRIA**—Pyrite production, as well as iron ore, is increasing considerably, and the *Schwarzenberg* mine is reported to have well exceeded in 1948 its 1947 production of 6,200 tons. The ore has an average sulphuric content of 35 percent.

**POLAND**—Iron ore production is reported to be achieving approximately 95 percent of its set goal, with zinc going over the top with about 105 percent. Official sources did not disclose tonnages.

**CZECHOSLOVAKIA**—Przibram, the famous old mining town, is now the administrative center for the whole Czech metal mining and smelting industry, with the exception of iron ore and pitchblende. The old mines in the area, among which is the *Anne* mine, the deepest mine on the European continent, are producing about half the country's total output of lead and silver. Monthly production is reported to be more than 10,000 tons monthly, with about four percent lead and 6.8 oz. silver per ton. The annual production goal of 205,560 tons for Slovakian lead-silver mines was expected to be exceeded.

**ROMANIA**—The Economic Plan for 1949, emphasizing development of mines and heavy industry, has been approved by the cabinet, following its presentation by Minister of Economy, M. Georgiu Dej. As specified by the plan, the government will reopen abandoned metal mines to investigate the possibilities of profitable operation by means of new production and ore dressing methods.

**HUNGARY**—The bauxite mines of the *Alumina-Ore Mines Company, Ltd.* (Hungarian-Soviet controlled on a 50-50 basis) at Iszkaszentgyorgy, County Fejer, are shipping 220,000 tons of bauxite to the alumina plants of Braunau, Austria, and Schwandorf, Germany. The shipments are being made with the permission of the Allied military commanders at a fixed price of \$8.00 per metric ton on 56 percent A1203 and three percent

price of \$8.00 per metric ton on 56 per SiO2 basis. Pig aluminum will be shipped to the United States.

**YUGOSLAVIA**—The lead-zinc mine of Lece, South-Serbia, is increasing production, following completion of a new 830' vertical shaft which has been equipped with a 75 hp. hoist.

**ENGLAND**—In Cornwall, the recently formed *Cornish Mining Development Association* recently submitted a memorandum to the government on the subject of nonferrous metal mining in the United Kingdom. The memo pointed out that many eminent mining engineers are confident that Britain still possesses considerable reserves of unmined nonferrous minerals. Following this

proclamation, the memo called for inducements to private enterprise which included: exemption of taxation on undistributed mining products, the remission of tax on the first 20 percent of dividends paid, higher priority for manpower and equipment, easier acquisition of mining properties, a return to free market prices for tin and other nonferrous metals, and the benefit of much extended government research. As nationalization of metal mining is not the declared policy of any political party, the memo suggested as an alternative to private enterprise, the formation of a statutory corporation for the United Kingdom on the model of the North of Scotland Hydro-electric board which would carry out preliminary exploration.

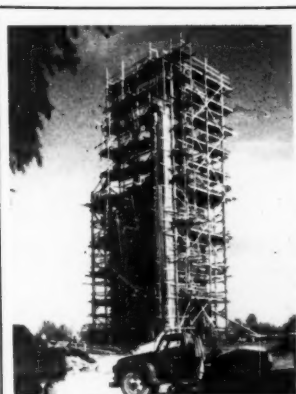
**CZECHOSLOVAKIA**—The iron mines of the *Spisska Nova Ves* district in Slovakia, among them the siderite mines of Roznava, Drnava and Zeleznik, are reported to be developing additional reserves as production continues. Latest monthly production figure of 115,685 tons achieved 95 percent of the target, it is said.

**ENGLAND**—A number of round tables have been installed by the *British Malayan Tin Syndicate, Ltd.*, to treat the finest material on the dumps at its *Basset* tin mine in Cornwall. About 900,000 tons of ore, averaging six lbs. of metallic tin per ton, are said to be available on the old dumps which have been accumulating for a period of some 200 years. The firm also has acquired other residue of over two million tons in Carnon Valley, about seven miles south-east of Basset. It is the company's intention to design and construct a concentrator in the valley to treat 400 tons of ore daily. At the *Basset*, 120 tons is being treated a day.

**PORTUGAL**—Capacity operations are reported at the *Jalles* gold mine in the Vila-Real district (Tras-os-Montes), operated by *Mines de Jalles Lda.*, a Portuguese company. The firm is exporting its concentrates to the United States.

**GERMANY**—Recent press releases that *Kaiserstuhl* would start mining niobium outcroppings in Sudbaden are now reported to be fallacious. Past attempts at mining these outcroppings have proved that the small deposits are scattered irregularly through the limestone, making operations unprofitable.

**YUGOSLAVIA**—The Yugoslav office in Berlin for the recruitment of skilled workers, among them miners from the Harz and Saxony districts, was recently closed down by Russian authorities, according to a Belgrade report. The last train carrying German workers was stopped at



**Finland's  
Newest Copper Mine**

The *Aijala*, Finland's newest copper mine, 120 kms. from Helsinki, was discovered in 1945 by Suomen Malmi Oy, a prospecting company, in a region where several small ore deposits have been located in the last 200 years. Based on 32 diamond drill holes put down by the company, estimates on ore reserves to a depth of 450' are one million tons, carrying 2.2 percent copper, 0.8 percent zinc, 30 percent pyrite, 1 gm. gold and 13 gms. silver per ton. Development of the mine was started in May of this year by the *Outokumpu Company*, and work is now proceeding to sink a shaft to a depth of 120 meters where the main haulage level will be opened. Mining, which is expected to start next summer, will be by the shrinkage stope method. A headframe 80' high (see above), power station, machine shop, change house, mine office, crushing plant, 300-ton flotation plant and laboratory will all be constructed into one unit, using reinforced concrete throughout.

**LESS COST**

**LESS COST PER FOOT WITH CHRISTENSEN**

LESS  
COST  
PER  
FOOT  
•  
LESS  
COST  
PER  
FOOT  
•  
LESS  
COST  
PER  
FOOT  
•

When the diamond drilling equipment is marked with "Christensen," it's stamped with a name that means

**LESS COST PER FOOT**

Christensen makes a complete line of surface and underground drills, drill rods and supplies, bits, reamer shells and casing bits.

LESS  
COST  
PER  
FOOT  
•  
LESS  
COST  
PER  
FOOT  
•  
LESS  
COST  
PER  
FOOT  
•

**LESS COST PER FOOT**



**CHRISTENSEN**

**DIAMOND PRODUCTS CO.**

1975 SOUTH SECOND WEST STREET

PHONE 6-8738 — SALT LAKE CITY, UTAH

50

Prague and returned to the Russian zone.

**GERMANY**—Effects of the currency reform are witnessed in the increasing production of lead and zinc concentrates. From 1946 until the reform, production remained consistently at about one-third of the prewar figure. Since July, however, output has been mounting and now has passed the 50 percent mark. Both mining and milling operations are concentrated in the British zone of Bizonia.

**ENGLAND**—In spite of the relatively high price of lead, there is little activity in this field in Great Britain. Investigations are reportedly being made in various parts of the country, however, and one property is being opened in Derbyshire near the site of the once celebrated Mill Close mine, which ceased production in 1938.

**CZECHOSLOVAKIA**—With the recent legalization of labor camps, plans have been announced in Prague for the establishment of two more such camps. The first, organized by a committee of the Miners Union, will provide for 450 reluctant workers. The second will be established at a camp in the Karlovy Vary, Karlsbad area, formerly used for the transfer of Germans.



**LATIN AMERICA**

**BRITISH GUIANA**—As soon as a two-year supply of ore has been blocked out early this spring at the Cuyuni Goldfields property, milling will be resumed, according to vice-president William Dann of Vancouver, British Columbia. It is hoped that the newly equipped mill will be able to maintain a 300-ton daily production schedule.

**BRAZIL**—With United States steel men paying \$9 a ton for 68.41 percent iron ore at the port of Victoria, the Itabira mine is finally climbing out of the red. Six months ago the price stood at \$4.80, while company officials figured they could more than break even at \$6.00. Despite transport problems, the company expected to ship at least 300,000 tons during 1948, as compared with 174,000 in 1947. The production goal set for 1950 is 1.5 million tons.

**CHILE**—Compania de Aceros del Pacifico, which is building the San Vicente steel plant, has sent an expedition to start development work on Madre de Dios Island in southern Chile, where almost pure marble limestone will be mined as flux for the steel plant. Previous exploration of the Madre de Dios deposit, said to be the largest of its kind, revealed about one billion tons of limestone,



### Drilling for Halite

In Brazil, large scale production of sodium carbonate and caustic soda is forecast in the near future, following an eight months program during which the basic sodium industry was given definite organization. Directors and engineers of four major companies—Industrias Brasileiras Alcalinas S. A., Companhia Falgema, Soda Caustica e Industrias Quimicas S. A., Companhia Nacional de Alcalis and S. A. Industrias Quimicas Electro-Cloro—reached an agreement whereby halite from the State of Sergipe will be distributed to the firms, allowing free competition. Initial raw material for Brazil's expanding industry will come from important deposits recently studied in the Cotiguipe area, where Industrias Brasileiras Alcalinas S. A. is now drilling (see above).

averaging 99.9 percent CaCO<sub>3</sub>. However, extreme weather conditions, with a rainfall of over 300" yearly, will make mining difficult. Luciano Cruz-Coke, Chilean engineer, is heading the expedition.

**ARGENTINA**—Construction of a plant to smelt Bolivian tin ore is occupying the interest of the Argentina mining fraternity at present. A recent decree has been signed by President Peron that permits the subscription of private and public funds to build the plant at Tucuman. Ore amounting to 8,000 tons annually will be imported for treatment, the contract for the delivery of this quantity to run for five years. The prime objective of the proposed plant is to make the country independent of the United States and Great Britain for its supply of tin plate, and to this end large scale manufacturing is scheduled.

**BRAZIL**—The Panelas mine of Plumbum S. A. is producing 10 metric tons of purified lead daily. The complex lead ore is argentiferous galena, mined in the Ribeira Valley on the boundaries between the states of Sao Paulo and Parana.

**CHILE**—Foley Brothers, contractors for the new Chuquicamata flo-

## INTERNATIONAL

tation plant, have started operations. Local labor is being used in nearly all construction operations, with Chilean and American engineers and technicians superintending the work.

**BRAZIL**—Increased production and exportation of magnesite from the State of Ceara is awaiting the improvement of the main railway and shipping facilities at Fortaleza. Within a year after the Rede de Viacao Cearense has been improved, it is expected that the railway will be able to carry from 30 to 40,000 tons of magnesite annually. Combustible oil for the calcination of the magnesite will be transported by tank wagons to the deposits, about 500 kms. from Fortaleza.



NORTH AMERICA

**BRITISH COLUMBIA**—The first important production and sale of iron ore in the province for upwards of

50 years has been arranged by *Privateer Mine, Ltd.*, its associated interests and the exporting firm of *Frith-Kershaw, Ltd.*, which have formed *Coast Iron Company, Ltd., N.P.L.* The new firm will work high grade iron ore deposits at Upper Quinsam Lake, 125 miles north of Victoria on Vancouver Island. An initial order for 50,000 tons of the 60 percent iron ore has been accepted and is being filled for the electric smelting plant at Wenatchee, Washington. As the operation develops, it is expected that orders for shipment to other points will be accepted. N. E. McConnell, managing director of Privateer, is general manager.

**MEXICO**—In the state of Durango, the generally poor economic situation has forced small mines to suspend operations at San Diego, Pedricena, Valardena, Promontorio, Guanacevi and Tepihuanes. More than 6,000 miners are reported to be out of work from these closures.

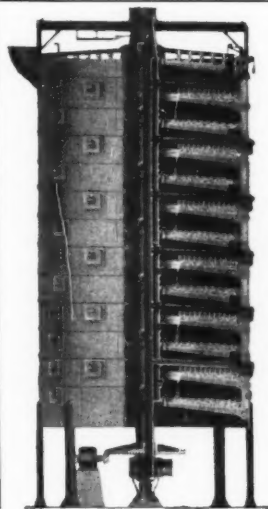
**ALASKA**—Diamond drill operations were recently completed for the season at the *Silver King* claims in the Wrangell mining district. Seven men were employed in the opera-

tions, which were carried on from underground stations. Results obtained proved favorable to the extent that additional drilling is being planned for next season by the owner, L. C. Berg of Sitka.

**QUEBEC**—New electrical equipment and additional production units have been installed in the 1,000-ton capacity mill of *Canadian Malartic Gold Mines, Ltd.* in Fourniere township, Malartic area. Prior to the increased capacity, the mill had been treating nearly 29,000 tons of low-grade ore monthly.

**ONTARIO**—With the clearing up of upper level low-grade stopes, *Kerr-Addison Gold Mines, Ltd.*, is looking forward to a year during which immense stoping areas will be opened at depth. According to official reports, a remarkable gold ore shoot has been opened on the 1,750' level, where two parallel bodies converge to make a 56' average width of .30 oz ore for a present known length of 1,400'.

**BRITISH COLUMBIA**—Dr. W. B. Burnett, president of *Cariboo Gold Quartz Mining Company, Ltd.*, re-



SIZES 8' 6" TO 22' 3" DIAMETER  
NUMBER OF HEARTHS, 1-16

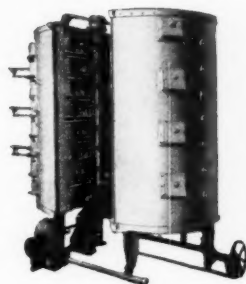


### MULTIPLE HEARTH FURNACE

#### ROASTING • CALCINING DRYING

ZINC ORES	QUICKSILVER
IRON ORES	MAGNESITE
COPPER ORES	LIMESTONE
TIN ORES	MOLYBDENUM ORES
NICKEL ORES	BONE CHAC
LEAD ORES	DIATOMITE
SODA ASH	LIME SLUDGE
FULLERS EARTH	MAGNESIUM
CARBON	CLAY GRANULES
PYRITE	ANTIMONY

AND FOR NUMEROUS OTHER MATERIALS



Pacific Laboratory Furnace is manufactured in two sizes—36" and 54" inside diameters having 6-8-10 Hearths and include the same features as the commercial size furnace.

**PACIFIC FOUNDRY COMPANY LTD.**  
*Engineers and Metallurgists*

1400 SO. ALAMEDA ST., LOS ANGELES

3100 19th ST., SAN FRANCISCO

551 FIFTH AVE., NEW YORK

ports that a new hoist and skip have been installed at the company's enlarged shaft in the Cariboo district. The new equipment will give access to the lower levels, enable a larger tonnage to be milled and permit resumption of the main development program at depth. No ore had been drawn from the lower levels for 18 months while shaft improvements were under way. Tonnage recently has been increased to 200 daily.

**MEXICO**—Reports of another rich gold strike at Las Trancas, San Ignacio municipality, Sinaloa, that have attracted numerous gambusinos are being investigated by the national commission for the stimulation of the mining industry. The committee's action was for the announced purpose of protecting the prospectors from disappointment and becoming objects of charity, as has happened in similar occasions in Mexico. Reports persist,

however, that the strike at Las Trancas has good prospects of becoming as spectacular a placer producer as El Tambor which received worldwide attention in 1931. Indications are that the Las Trancas placers are extensions of El Tambor.

**HONDURAS**—New York & Honduras Rosario Mining Company, whose main operation has been at San Juancito for nearly 50 years, now has its new Mochito and El Dorado plants in operation. The Mochito plant, which is situated near Lake Yojoa in Honduras, is treating a complex ore by combined flotation and cyanidation. The El Dorado plant, in the Republic of San Salvador, is a straight cyanide operation.

**SALVADOR**—Production at *Minas Montecristo, Inc., S. A.*, has been increased by the installation of new equipment in the cyanidation circuit. Montecristo, which has been a steady

silver producer for years, is situated in south Salvador near the Honduras border. E. P. Thompson is general manager and Angel Madeo is mill superintendent.

**ARIZONA**—Additional flotation and filtering equipment has been ordered by the *Shattuck Denn Mining Corporation* to increase mill capacity to 15,000 tons monthly in 1949. At present the company is employing a crew of 155 in mine and mill operations to produce 12,000 tons of complex sulphide ore monthly from its *Iron King* mine at Humboldt. Recovery of metal values is by differential flotation, producing a lead concentrate high in precious metals, a zinc concentrate low in gold and silver and a high iron fluxing concentrate for additional recovery of the precious metals. Underground, the *Iron King* shaft is being extended to the 1,450' level, while the extension shaft has been sunk to the 700' level and is now being lined with steel sets. Development on the 1,060' and 1,170' levels continues to show satisfactory widths and grade of ore.

**BRITISH COLUMBIA**—Marking a revival of the *Alice Arm* silver camp, *Torbrut Silver Mines, Ltd.*, has placed its 300-ton mill in operation. While efforts in recent months have, for the most part, been directed to getting the property into production, plans for further ore development will receive renewed attention in the near future. Plans are said to call for a long low-level tunnel to extend under the orebody at depth. Work to date in proving extensions of the indicated ore has not limited the deposit at depth, and strong indications are also said to exist above the present workings. Financing the operation is the *Mining Corporation of Canada*, which has advanced about \$1,750 thousand. *Torbrut* goes into production with a total indicated ore reserve on two main levels of about 645,000 tons, averaging 19.3 oz. silver per ton.

**ONTARIO**—A 72-inch continuous sintering machine, an addition to the three 60-inch machines at the plant, has been installed by *Algoma Ore Properties, Ltd.*, on the *Michipicoten* iron range. The combined capacity of the expanded plant facilities brings the daily sinter capacity up to 3,000 tons daily, or approximately one million tons per season. *Algoma's* iron ore production this past season came from the *Victoria* open-pit mine, which is now being converted to an underground operation.

**NORTHWEST TERRITORIES**—*Captain Yellowknife Gold Mines, Ltd.*, has acquired for \$50 thousand cash and 150,000 treasury shares a group of claims adjoining the *Voy* group in the Great Slave Lake area.



### BRALORNE TO CARRY ON EXTENSIVE SHAFT SINKING PROGRAM

British Columbia's largest gold producer, *Bralorne Mines, Ltd.*, will carry out an extensive shaft sinking program during the coming months. The *Empire* shaft will be sunk an additional 900' from the 20th level, and the *Crown* shaft will be extended some 600' from the 20th to 24th level. Diamond drilling below the present bottom 20th level has given encouraging evidence of the continuation to greater depth of the *Bralorne* orebodies, so that substantial additions to ore reserves can be expected when development of the new levels gets under way. Present ore reserves are estimated at roughly 1,000,000 tons of half-ounce grade.



## INTERNATIONAL

Finances to carry on exploration will be provided under an option agreement with *Industro Mining Company*, which has underwritten 250,000 shares.

**MONTANA**—Using coyote drift blasting, *Ruby Gulch Mining Company* of Zortman recently broke 130,000 tons of ore at a cost of 5½¢ a ton in its glory hole operation. More than a year's supply of ore is now provided for gravity drawing, and this increased production will reduce operating costs below \$1.60 a ton.

**NEW MEXICO**—The *Peru Mining Company* of Silver City once again is carrying on production operations at its *Pewabic* zinc mine, which had been closed since June, 1947. Until the last raise in zinc prices, the company had curtailed operations at its Grant County properties, maintaining only a limited amount of milling at the Deming concentrator. The reopening of the *Pewabic* provides employment for an additional 100 men on a two-shift basis.

**SALVADOR**—*Minas Metapan*, a new producer in Salvador, has started shipping lead concentrates to the United States. Rene Keilhauer of San Salvador is company president.

**MEXICO**—Expressing confidence that Oaxaca can become an important mining center, exploration activities have been resumed by eight brigades of engineers and geologists, headed by Ing. Jenaro Gonzalez Reina, chief of the geological section of the National Economic Resources Research Institute. The commission announced that claims to many Oaxaca ore bodies, discovered during the brigades' first phase of explorations, already have been granted.

**ONTARIO**—A new \$1,000,000 sulphuric acid processing unit was officially opened recently at Hamilton by Dr. H. C. Littler of *Canadian Industries, Ltd.* The plant replaces older-type sulphuric acid methods formerly employed by the company and will produce close to 250 tons of acid daily. It is expected that the new installation will increase Canada's annual sulphuric acid production by some 30,000 tons, as well as replacing about 50,000 tons previously manufactured in older plants.

**BRITISH COLUMBIA**—*Granby Consolidated Mining, Smelting and Power Company*, operating at Copper Mountain and Allenby in the Similkameen district, is installing additional mill equipment, with a view toward handling an increased tonnage. Latest production figures show the company has been milling more than

4,500 tons of copper ore daily. A. S. Baillie is company president.

**MEXICO**—The *American Smelting and Refining Company* is in danger of losing one of its richest Mexican mines, the *San Pedro*, an important silver-lead producer near San Luis Potosi city. One of Mexico's oldest mines, the *San Pedro* has had to be abandoned, perhaps permanently, because of the progressive

spreading of lethal gasses, emanating from the extreme depths of the shafts. Some 3,000 miners, thrown out of work by the closure, are demanding full pay during the idle period.

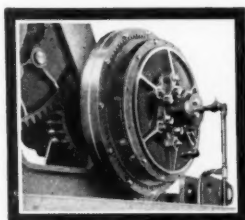
**QUEBEC**—President Stewart Troop of *Candego Mines, Ltd.*, reports that work is being speeded up to open and prepare for mining high-grade ore at the company's property in Gaspé Nord. The first objective is

## Shovel Operators Are Talking About . . .

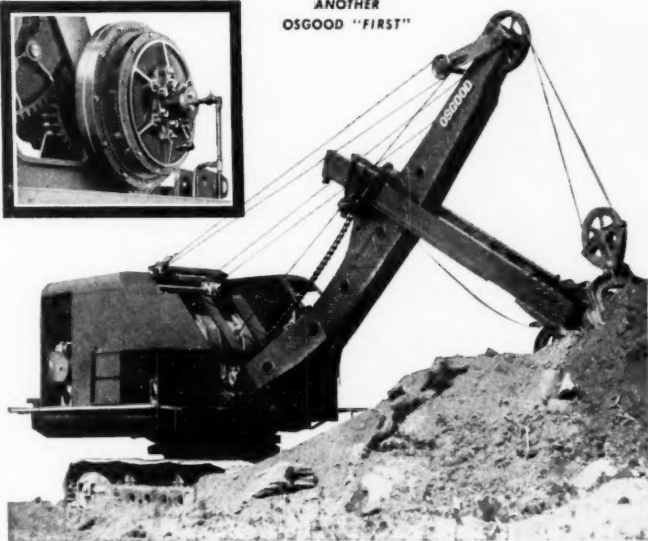
A revolutionary new power shovel clutch that provides smooth, positive action in place of jerky, uncontrolled performance . . . a clutch that seldom requires adjustment . . . a clutch with only one working part, and without a single cam, lever, bolt, piston or valve.

It's a power shovel clutch with direct air power that assures positive control, without any "grabbing" effect . . . a clutch that needs no mechanical attention . . . a clutch whose simple operation automatically compensates for any wear on the clutch linings.

### THE OSGOOD AIR-CUSHION CLUTCH



ANOTHER  
OSGOOD "FIRST"



POWER SHOVELS • CRANES • DRAGLINES • CLAMSHELLS • BACKHOES • PILE DRIVERS

THE **OSGOOD CO.** *OSG* THE **GENERAL CO.**  
EXCAVATOR

DIESEL GASOLINE OR ELECTRIC POWERED • ½ TO 2½ CU. YD. • CRAWLERS & MOBILCRANES

## INTERNATIONAL

to mine some 15,000 tons of ore, running high in lead and silver, indicated in a portion of the ore zone now opened for a length of about 600'. The main objective is the further development of this ore zone, both laterally and at depth, over its indicated length of more than 2,000'.

**ALASKA**—In the Willow Creek district, about 60 miles northeast of Anchorage, Lloyd Hill has developed sufficient ore at the *Gold Mint* mine to erect a small pilot mill, which he and his crew are now building.

**MEXICO**—Construction of 105 modern homes has been started by *Cia. Minera Asarco, S. A.* for workers at its Monterrey, Nuevo Leon unit. Providing these homes, which will total 480, is part of the peace pact made recently by Asarco with the Mexican miners union. Costs of 225,000 pesos (\$72,500) will be furnished by small wage reductions.

**ONTARIO**—Diamond drilling has been resumed at the gold property of *Delta Red Lake Mines, Ltd.* in Balmer township, Red Lake area. Ten holes, involving some 3,000', are planned to clarify the ore picture and guide future development.

**MEXICO**—Higher prices and greater demand for lead, copper and zinc, of which Mexico is an important producer, are affording an excellent opportunity for Mexican mining to shake off its own and the Mexican economic depression; however, a grave obstacle to this opportunity is the new extra 15 percent ad valorem tax on exports. This statement was made to the Mexican government by the Mexican Mining Chamber and Confederation of Industrial Chambers in urging the new tax be abolished. They contend that the real aid to mining is less tax on exports because sales abroad are a prime prop to Mexico's basic industry. Reports published abroad that the tax had been removed were denied, with the explanation that confusion arose from the reduction in the mining production impost.

**QUEBEC**—A diamond drill campaign has been started on the gold properties of *Ordala Mines, Ltd.*, adjoining Waite Amulet holdings in Dufresnoy township. The first hole was spotted on the northwest corner of the property, half a mile from the Waite orebody.

**SASKATCHEWAN**—The Tobey pitchblende discovery at Black Lake on the east end of Lake Athabaska has been acquired by *Transcontinental Resources*, which will arrange financing and form a company to operate the property. The property consists of a 12 mile by 2½ mile "withdrawal area," granted to Tobey under government concession arrangement. Trenching and stripping

is said to have exposed pitchblende mineralization along altered zones in sedimentary gneiss for a distance of 2,400'.



### OCEANIA

**AUSTRALIA**—To stimulate the mining industry in Victoria which employed 6,315 men in 1939, as compared with 1,284 today, the state government (Liberal Party) has advanced £17,500 to five Bendigo gold mining companies: *Deborah*, £6,000; *Central Nell Gwynne*, £5,000; *North Virginia*, £2,500; *Nell Gwynne Reefs*, £2,000 and *South Deborah*, £2,000. The first four companies have been shaft sinking for some time, preparatory to testing their deeper ground.

**AUSTRALIA**—At Ballarat, *Toohey Brothers* have successfully applied for the forfeiture of *Gordon Gold's* lease, discovered by their father, at Springbank, Victoria. The brothers will reopen the mine which has been idle since 1942.

**AUSTRALIA**—*Gordon Gold N.L.* and *Gold Boring and Prospecting N.L.* have jointly taken a two-year option to purchase the *Blue Moon* mine at Tennant Creek, Northern Territory, for £90,000.

**PHILIPPINES**—The *Pitkeel Mining Company* is continuing development of what was formerly known as the *Sheelin* group on the Mountain Trail, about 18 kilometers north of Baguio. High free gold values, said to occur frequently in small stringers, are being recovered during development; however, the major values occur in sulphides to be recovered after a flotation plant has been installed. H. M. Januskiewicz is manager.

**AUSTRALIA**—*Skipper Gold Mines N.L.*, operating at Tennant Creek, Northern Territory, reports an estimated return of three oz. gold per ton on the last 260 tons of ore crushed. According to R. W. Coxon, director of mines for Northern Territory, the minimum grade for economic ore on the Tennant Creek field is seven dwts. per ton. Calculations based on crushing records at the government batteries show that between August 1946 and December 1947, the average yield from the whole field was 30.6 dwts. per ton; however, if the yield of the two major producers, Whippet and Edna Beryl, was excluded, the average was reduced to 12.8 dwts. per ton. About a third of the total ore crushed returned less than six dwts. per ton.

**AUSTRALIA**—T. A. Foley, minister of mine for Queensland, has announced that *Titanium and Zir-*

*conium Industries Pty. Ltd.* has been authorized to prospect for three years 30 square miles of North Stradbroke Island and 15 square miles of Moreton Island. The company will spend £75,000 on this new project and, provided terms of the agreement are kept, it may retain rights on the properties for another two years. The sand on North Stradbroke Island already has been tested to a depth of 214' by *Australian Mining and Smelting Company, Ltd.* Both companies are associates of *Zinc Corporation*.

**AUSTRALIA**—The *Triton* gold mine in Western Australia is closing down. Operation costs (61.2 shillings a ton) were excessive, and in the last operating year, the company showed a loss of £49,803 after treating 62,288 tons of 6.42 dwts. ore. According to surveys, 62,000 tons of extractable ore, estimated to contain more than eight dwts. per ton, remain in the mine. Sir Walter Massey-Greene, chairman of directors, will make a statement at an early date regarding disposal of the assets which include a modern mining plant.

**AUSTRALIA**—J. T. Eddy, consulting engineer for *Coolgardie Gold Mines*, reports a showing of free gold which should bring at least an oz. per ton from the company's property in Western Australia. The company has installed a new compressor.

**PHILIPPINES**—L. L. Wilson, president of *Benquet Gold Mining Association*, reports that development is proceeding satisfactorily on the company's property in Mountain Province, near the border of Pangasinan Province. The property consists of 200 gold-silver-copper claims in four groups: the *San Expedito*, *Pulupandan*, *Wilson* and *Pokia*. The isolated location of the claims makes development difficult, but the operators believe the problems can be surmounted. Harry Oblades is mine foreman in charge of operations, and Dominador Garcia is consulting geologist.

**AUSTRALIA**—*Mountain View Gold N. L.*, the newly formed company which acquired the sensational *Mountain View* mine at Cue, Western Australia, has just completed the milling of 625 tons of ore from which the final recovery will approximate 4,275 oz. gold worth about £46,000. The mine appears to be maintaining the richness which characterized the operations of the selling syndicate. Operations will be followed with great interest in view of the one-time importance of the adjoining *Great Fingall* mine, and the fact that the rich shoots in the *Mountain View*, although smaller than the big shoot in the old mine, are showing encouraging vertical persistence. Erection of a milling plant, however, will await results of further development work.

## INTERNATIONAL

**AUSTRALIA**—Earlier reports of important uranium deposits at Mt. Painter in South Australia are now being substantiated by government mining teams which are drilling in the vital 160-sq. mi. area. According to a report by Samuel B. Dickinson, state director of mines, drilling has struck a mineral deposit, registering the same radioactive intensity as pitchblende, richest of all uranium-bearing ores.

**AUSTRALIA**—*Western Mining Corporation* has started a geophysical survey of the salt lake area, southeast of Kalgoorlie in Western Australia. Although this work is still in the initial stages, an apparent anomaly has been disclosed which will be tested by drilling. The company holds prospecting areas totaling 300 sq. mi. in this region.

**AUSTRALIA**—The Queensland State Government reports that plans are being considered to utilize about three million tons of pyrites lying on the surface at Mt. Morgan. It is estimated that a project for the production of sulphuric acid would cost about £1,500,000.

**AUSTRALIA**—A new silver field is reported 90 miles east of Pine Creek

in Northern Territory, and *Carbonate Lead Syndicate, N. L.*, has been formed in Adelaide to explore leases totaling 164 acres. Four workable ore bodies are said to be available and, from sampling, the syndicate expects a mill grade of 20 percent. Concentrates will be shipped from Darwin.

**AUSTRALIA**—E. J. Morgan, chairman of directors of *Mount Morgan Mines*, Queensland, told shareholders recently that the grade of ore being treated by the company has improved, and the No. 2 mill, formerly idle, is now treating 20,000 tons during each four-week period. He also said that ore reserves appear to be sufficient for another 20 years of operations.

**AUSTRALIA**—Some years ago when the Main Roads Department was gravelling the Geraldton-Mullwa Road in Western Australia, it was found that the high mineral content of the gravel at Tenindewa impaired its binding properties. Chemical analysis disclosed the presence of 50 percent manganese ore. Litigation and subsequent wartime confusion prevented exploitation until recently when the present owner, W. Stokes, who believes the discovery to be an

important one, sent six tons of ore to the Windowie iron plant. Silica and iron appear to be less than two percent.

**AUSTRALIA**—Mining circles in Perth are interested in the report that a new company, *Nevora Gold Mines, Ltd.*, has been incorporated in South Africa with a capital of £1,000,000. The new firm will take over 25 gold mining leases, covering 478 acres in the Yilgarn gold fields, with the intentions of blocking out an initial million tons of ore 18 months after sinking the main new vertical shaft.

**AUSTRALIA**—The *Mount Robe* mine, which lies northwest of the *Broken Hill* mine in New South Wales, is being reopened to take advantage of the high price of lead. The ore is relatively clean galena, about one percent zinc and 2.7 oz. silver per ton.

**SOUTH AUSTRALIA**—A new company is being formed in Adelaide to investigate a silver-lead discovery, 90 miles east of Pine Creek, where an area of 164 has been taken over. Sampling so far has shown an average of 20 percent lead on four ore bodies, with disclosed widths up to 10'.



**FLEXIPIPE**  
The improved flexible tubing for  
mine and tunnel ventilation

This flexible air tubing is ready for immediate, easy installation. On account of its flexibility, it can be put up or taken down in a fractional part of the time required by a more rigid means of face ventilation.

Write for free sample and full information.

**BEMIS BRO. BAG CO.**  
420 Poplar Street, St. Louis 2, Mo.

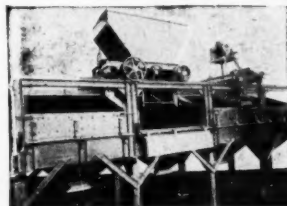
**MINING WORLD**  
with which is combined  
**MINING JOURNAL**  
The Production Magazine of the Metal Mining Industry  
Published at  
**SAN FRANCISCO, CALIFORNIA**  
U. S., North, South and Central American countries—\$3.00 per year  
All other countries \$4.00  
Includes Mine Development and Directory Number  
13 ISSUES

## Smelting on Site

with  
**MACE Furnaces**  
and  
**Sintering Hearths**

Saves high transportation and treatment charges on your ores and concentrates.

Wire or write for new catalog.



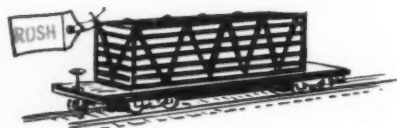
Standard sizes 5 to 250 tons capacity. Working scale tests on ton lots or larger made at our Denver smelter. Send us an analysis for preliminary report.

**The Mace Company**

**FIRE CONCENTRATION METALLURGISTS**

2763 BLAKE STREET, DENVER 5, COLO., U. S. A.

# WHAT'S A Delivery Promise THESE DAYS?



A promise is still a promise, and Colorado Iron Works is proud to be known as a promise keeper. There's a rule of long standing at Colorado Iron that no delivery is to be missed—ever.

Here is a recent example of the appreciation prompt deliveries receive:

"The management has asked me to write you and express our appreciation at receiving this machine right on schedule. We realize how difficult it is to meet delivery promises these days, and you and your organization are to be congratulated on the manner in which our order was handled. It has helped us a great deal at this end, and will enable us to have the densifier in place with all connections made several days ahead of the anticipated date."

This is a paragraph quoted in its entirety from a letter dated Sept. 30, 1948, from the American Zinc Company of Tennessee after receipt of a 48" Akins densifier from Colorado Iron Works Company.

Quality must be maintained with delivery. Colorado Iron engineers have consistently turned out products which are capable of giving better results than were originally specified, say the operators.

Ask for the figures that prove these statements—we have them! For top performance and on-time delivery, permit our engineers to consult on your milling problems and plans.

A battery of five Akins classifiers in use at the Noralyn mine of International Minerals and Chemical Corp.



# COLORADO

IRON WORKS  
COMPANY

## MAIN OFFICE & WORKS, DENVER 2, COLO., U. S. A.

Canadian Locomotive Co., Ltd., Kingston, Ont., Can.; Head, Wrightson & Co., Ltd.; Stockton on Tees, Eng.; John Carruthers & Co. (Pty.) Ltd., Sydney, Aus.; Vancouver Iron Works, Ltd., Vancouver, B. C., Can.; Head, Wrightson & Co., S. A. (Pty.) Ltd., Johannesburg; Edw. J. Nell Co., Manila, P. I.



Dr. Robert B. Freeman has been appointed chief metallurgist for the Columbia Steel Company, succeeding Gordon L. von Planck, who has been made metallurgical consultant.

Harry W. Knight, Toronto, Ontario, president of the Golden Manitou Mines, has been elected a director of the American Zinc, Lead & Smelting Company.

Robert F. Knight has been appointed master mechanic of the Oliver Iron Mining Company operations in the Coleraine district of Minnesota. John C. Howbert, mining engineer of Denver, Colorado, and M. D. Van Delinder, mining engineer of Butte, Montana, have joined the Oliver engineering department staff.

John E. Bemis, mining engineer, has joined the engineering staff of the M. A. Hanna Company at Hibbing, Minnesota.

J. H. Glenmon, chief engineer and manager of the Hibbing, Minnesota, office of Western-Knapp Engineering Company, has been transferred to the company's main office in San Francisco. He is succeeded by Warren L. Howes of San Diego, California.

George R. Milne has been appointed operating manager of the National Carbide Corporation, according to a recent announcement by J. Carl Bode, president. Milne will continue to have his headquarters at National Carbide's Louisville plant. Simultaneous with Milne's promotion, Russell T. Lund was made assistant operating manager. His headquarters are at the firm's Ivanhoe, Virginia, plant.

George A. Komadina is now employed as assistant metallurgist at the Central mill of the Eagle-Picher Mining and Smelting Company at Miami, Oklahoma.

T. H. Sackett, formerly general superintendent for the Monarch Galena Company, may now be addressed at 231 South Grant, Fort Collins, Colorado.

M. J. Gleason, formerly in charge of diamond drilling in the Panama Canal Zone for the United States Government, has joined the E. J. Longyear Company of Minneapolis as superintendent of the company's contract diamond drilling on the Mesabi Range.

#### Obituaries

Dr. Frederick G. Cottrell, 71, former director of the U. S. Bureau of Mines, died at Berkeley, California, on November 16. One of America's best known scientists, he invented the Cottrell Precipitator for clarifying air and gases and breaking emulsions of water in petroleum. Relieved, by choice, of direct activity in the commercial development of his invention, Cottrell followed the path of scientific exploration, working with the Government Bureau of Mines, Department of Agriculture, TVA and Re-

search Associates, Inc. His life was crowded with achievement and honors which included: Chairmanship of the division of chemistry and chemical technology; National Research Council; the Perkin medal; the Willard Gibbs medal; the medal of the Mining and Metallurgical Society; the Holly medal and the medal of the American Institute of Chemists.

Myrl L. Jacobs, 63, vice president, Raw Material Properties, Bethlehem Steel Company, died November 13 at the Pan-American guest house on the island of Trinidad, British West Indies. He was a member of the A.I.M.E., American Iron and Steel Institute and the Mining Club of New York.

Parley J. Johnson, 53, chief metallurgist for Consolidated Coppermines

Corporation, Kimberly, Nevada, died November 18.

Paul Troester, 52, operator of the Tomboy lease, 15 miles from Battle Mountain, Nevada, died unexpectedly November 22.

Albert H. Trestrail, 59, district safety supervisor until his retirement last September for Pickands, Mather & Company on the Menominee iron range in Michigan, died November 13. He had been connected with the company's safety department for 30 years.

Brent S. Drane, 67, a former member of the National Resources Planning Board and state geologist and director of the North Carolina Geological and Economic Survey, died November 23 at Durham, North Carolina.

## EXPERT DIAMOND CORE DRILLING

**is your answer to today's  
high cost of ore development**

Boyles Brothers drilling experts can save you money in mining and ore development. Exploration with diamond core drilling averages only 10% of the cost of standard drifting, yet it furnishes you accurate, reliable geological information.

50 years of drilling experience, plus engineering know-how are your assurance of expert work, dependable results.

# Boyles Bros.

**DRILLING COMPANY**

1321 SOUTH MAIN STREET • DIAL 6-8554 • SALT LAKE CITY, UTAH

## precipitates—ROCKY MOUNTAIN

### New Cripple Creek Mill To Be Built This Spring

With preliminary plans for the new gold ore reduction mill progressing rapidly, A. H. Bebee, vice-president and general manager of the Golden Cycle Corporation, Cripple Creek, Colorado, said recently that actual construction will get under way this spring.

The mill will be built at Elkton, midway between Cripple Creek and Victor, Bebee said. The buildings will be situated below the main highway, permitting easy access to the mill for the trucks which will haul ore from the various mines of the district. Because of the contour of the ground, it will also be possible to handle the ore by gravity.

Officials and engineers of the corporation have been working on plans for the new mill since May of last year when it was decided to move the mill from its present site in Colorado Springs to the Cripple Creek district. Now, with the actual construction date approaching, O. W. Walforth of Denver has been engaged to supervise the design and construction of the plant.

### New Park Will Construct Model Town for Employees

An architect is being employed by the New Park Mining Company to lay out a model village while consideration is given to a plan providing an opportunity for company employees and their families to acquire modern homes.

To have a nucleus of 25 new houses, the town will be located approximately six miles north of Heber, Utah, on U. S. Highway 40. The company will survey the town, construct roads and sewers and secure federal approval for loans.

Additional features now being contemplated include a club house, swimming pool and golf course, although proper consideration is being given to the matter of cost.

A circular logo with the word "COLORADO" in a stylized font across the center.

Rehabilitation of the Durango, Colorado, smelter is now in progress, according to Philip C. Leahy, Colorado materials manager for the Atomic Energy Commission. Leahy

also confirmed the Washington announcement that the plant will be operated by the *Vanadium Corporation of America*, under the direction of Dennis Viles, western manager for the corporation.

Employing six men in mining operations, W. L. Davenport and Harold Horn are shipping an average of 125 tons of ore monthly from the *Wellington* mine at Breckenridge, Colorado. The partners also are operating the *Rose* mine at Montezuma, employing four men, and have shipped 100 tons since its recent opening. In addition to these two producing properties, the operators are said to be preparing to open the *Minnie* mine, a lead producer.

The *Great Eastern Mining Company*, which started ore shipments last summer from its claims in Burns Gulch near Silverton, Colorado, has gradually stepped up production to 75 tons daily. President William L. Chase said recently. Chase also said that returns for 1948 are expected to repay the \$80 thousand spent in building roads, terminal facilities and in development work, plus a small profit. When the heavy snow sets in, operations will be suspended until spring.

Corporation papers have been filed in Denver by the *Atomic Research Corporation*, which is opening a research laboratory in one of the Peterson Field buildings at Colorado Springs, Colorado. One of the first research projects to be undertaken, company officials said, will be the application of electronics to locating and extracting rare metals and minerals. Henry C. Mulberger is president.

Plans for deeper development of the *Jerry Johnson* and *W P H* mines on Ironclad Hill in the Cripple Creek district have been revealed by Jesse Simmons, president of *Champion Mines Company*, 941 Monroe Street, Denver 6, Colorado. Five-year leases have been secured on the entire properties extending 500' below the present lowest 1,000' levels. At a cost of \$40 thousand, the company proposes to sink the *Jerry Johnson* shaft 200' and open two new levels, hoping thereby to develop additional ore for shipment to the new *Golden Cycle* mill. Production, meanwhile, continues from the 150' level, where an ore discovery was made early in 1948.

*Lombard Mines Company*, which has been operating steadily for the past three years on upper Fall River near Idaho Springs, Colorado, reports that it will continue both mine and mill operations through the winter.

Preparatory to winter operations, two shifts were employed daily to process all stockpiled ore in the mine workings and so allow space for new production. Concentrates are shipped to the Leadville smelter. Oscar Stutenroth is president and general manager of the company, and Thomas G. McGrath is superintendent.

Robert M. Taylor of Denver has engaged the *Union Supply Company* to supervise unwatering of the old *Caledonia* mine shaft, one and a half miles south of Cripple Creek, Colorado. When unwatering has been completed to a depth of 150', Taylor plans to examine the mine thoroughly, with a view toward extensive development work if prospects are encouraging.

A circular logo with the words "SOUTH DAKOTA" in a stylized font across the center.

Prospectors are now combing the mineral-rich Black Hills of South Dakota in an attempt to locate commercial quantities of uranium-bearing ore. Some traces of pitchblende and radioactive pegmatites have been found, although to date none has proved of high enough content to be profitable. Clyde Cessna, secretary of the Black Hills Mining Association, believes there are profitable deposits to be found. Since nearly every known mineral is found in the Black Hills, Cessna said, it is reasonable to believe that uranium-bearing ores are present. Few prospectors are as yet using Geiger counters in their search, which may account for the lack of commercial discoveries.

Directors of the *Holy Terror Mining Company*, owner of the once-richest gold producer in South Dakota's Black Hills, met recently in New York City for the purpose of reorganization, with a view toward reopening the *Holy Terror* mine. Operations were suspended at the property in 1941, and mining engineers now estimate that six months would be required to unwater the 1,200' shaft and recondition equipment before work could be resumed. George Flavin of Keystone is company secretary.

Bucking the rising prices of labor, materials and supplies, the *Bald Mountain Mining Company* is carrying on operations at approximately three-fourths capacity at its *Portland* gold mine, Trojan, South Dakota. Low-grade ore is being treated at the

## AMERICAN SMELTING AND REFINING COMPANY

Has Always Offered an Unfailing Market for

**GOLD . . . SILVER . . . COPPER . . . LEAD . . . ZINC**

**Ores . . . Concentrates . . . Bullion . . . Precipitates . . . Furnace Products**

For Schedules, Freight Rates, etc.

Write to Your Nearest Office

405 Montgomery Street  
San Francisco 4, Calif.

P. O. Box 1111  
El Paso, Texas

700 Pacific Nat'l Life Bldg.  
Salt Lake City 1, Utah

810 Valley Bank Building  
Tucson, Arizona

Tacoma 1, Washington

East Helena, Montana

607 First National Bank Building, Denver 2, Colorado



**AMERICAN SMELTING AND REFINING COMPANY**

### DETACHABLE BITS HOT MILLING

- We will hot mill, re-temper and harden the popular types and sizes of rock bits.
- We re-shank, re-thread, and re-condition any type, size, or length of Drill Steel.
- We manufacture and maintain a complete stock of new drill rods, gads, chisels, spades, and all other tools used in Pneumatic Paving Breakers or Jack Hammers.

## EMSCO CONCRETE CUTTING COMPANY

2751 East Eleventh Street

Los Angeles 23, California

AN 3-4151

### For Rent

Large and small portable air compressors, paving breakers, jack hammers, chipping hammers, pneumatic tools, and air hose.

*We specialize in concrete cutting and demolition work.*

**EMSCO  
AIR HOSE COUPLINGS**

### Dependable, Prompt Service

Phone or write  
FOR PRICE SCHEDULES

company's 365-ton cyanide mill, giving the company only a slight edge in the precarious balance between profit and loss.

## UTAH

**Park City Consolidated Mines Company** is nearing completion of an exhaustive rehabilitation program begun in 1947 after a five-year shutdown of its Park City, Utah, property. Included in this work has been the retimbering of the main shaft to the 450' level and the north crosscut of the Ontario drain tunnel for a distance of 5,000'. Expenditures for this work have totaled \$38 thousand. Considerable equipment, including several thousand feet of track and pipe, blower, compressor and a three-ton Greensburg battery locomotive, have been shipped from the company's Missouri property and installed at Park City, and it is expected that development can be launched in a short time. Richard C. Badger, vice-president, is directing operations, and work at the mine is under the supervision of John I. Kasteler.

The **Silver Standard Mining Company** has started an aggressive diamond drilling campaign at its **Ophir-Hill** property, south of Tooele, Utah. At the latest report, more than 300' had been cut, with a sulphide formation showing at 200'. The lower tunnel now has been driven 1,750' east of the portal, and the drill is continuing

exploration toward the east in hopes of crosscutting north and south fissures in Ophir Hill. The upper tunnel, which has also been reopened and rehabilitated, is being used for ventilation purposes. Dr. L. N. Ellsworth is president.

A 10-year lease has been acquired by Hedburg and Brown of Tooele on the property of the **Mineral Valley Gold Mining Company** in the House Mountains, southwest of Delta, Utah. The contract is said to require a substantial amount of work annually and calls for immediate construction of a pilot mill for the reduction of gold, tungsten and platinum. The company is to receive 15 percent of the gross return.

Sixty lbs. of rails and other heavy equipment is being installed by **Park Utah Consolidated Mines Company** of Keetley, Utah, in its extensive new exploratory drifts in the Bonanza flats area. In addition, facilities have been completed for mining the shaft orebody, consisting of about 8,500 tons of good ore. First shipments already have gone forward. P. H. Hunt is general manager.

The **North Lily Mining Company**, Eureka, Utah, has curtailed work in its property as well as in the **Eureka Bullion and Tintic Bullion** by pulling the pumps in the North Lily. Lease operations in the **Eureka Lily** continue. Ore values at these properties are in lead, zinc, copper, gold and silver.

Re-discovery of the Cardiff vein in a seven ft. width has been reported by Shelby Nielson, lessee at the **Cardiff** mine, between Big and Little Cottonwood Canyons in Utah's Alta mining

district. The discovery was made about 50' from the former Cardiff shaft, and less than 40' from the line dividing the Cardiff and **Columbus Rexall** claims. The vein was lost after the previous ore discovery was cut off by a limestone wall. Early assays showed lead, zinc, and copper in good quantities.

Consistent weekly ore shipments of about 40 cars of approximately 50 tons each are forecasting a profitable year for the **Chief Consolidated Mining Company**, operating in Utah's Tintic district. Most of the production is coming from the area in the old No. 1 mine, from levels that were under water for more than 20 years, and from newly developed lower levels. The **Gemini** also has been unwatered and is reported to be producing a good tonnage.

Latest reports are that the **East Utah Mining Company** has reached the 4,471' mark in its tunnel and is now approaching the **McHenry** fissure. Tunnel work at East Utah's Park City property is being done by **Newmont Exploration, Ltd.**

The **Frisco Silver Lead Mining Company** of Frisco, Utah, has given a lease to Frank Dean and associates after **Western Alloys** withdrew from its property. Good grade copper ore is being shipped by truck to Salt Lake Valley smelters.

## WYOMING

A large orebody, containing values in gold and platinum, has been discovered by the **Independence Gold Mining Company** on its large property, four miles from Centennial, Wyoming. Assaying 0.04 oz. platinum and \$6.30 gold per ton, the ore was opened in a dyke said to be over 30' wide. The company has conducted metallurgical tests on the ores and plans to build a pilot mill at the property for their concentration. Alvin M. Burhans of Denver is company president.

In addition to the discovery of commercial amounts of uranium in the Red Desert area, south of Rawlins, Wyoming, uranium has been found in the old **Silver Cliff** mine near Lusk. Once the state's greatest single silver producer, the property had been abandoned for some time until recent investigations determined the presence of uranium in the rock, running 1.32 percent U<sub>3</sub>O<sub>8</sub>. According to B. W. Brown, research chemist at the university natural resources research institute, another known deposit of radioactive ore is in the Big Horn Mountains, where radioactive thorium is found. Still another possibility is the Black Hills Range in the northeastern part of the state.



### GOLD EMPIRE COMPLETES TUNNEL

Completion of the Rosebud tunnel was announced recently by Clyde T. Carson, president and general manager of Gold Empire, Inc., Cripple Creek, Colorado. The tunnel, which was driven from the shaft house into Rosebud Hill, intersected the Mary Nevin vein at a depth of 160' from the portal. Carson reported the vein as strong, approximately 50' wide and intersected by a basalt dyke about 15' in width near the point of intersection. Winter plans include continued exploration of the Mary Nevin vein and opening of the Mary Nevin shaft. The entire Gold Empire premises have been reconditioned and placed in readiness for larger-scale operations. The above recent photo shows, from left to right, the mill building, ore bins, Mary Nevin shaft and portal of the new Rosebud tunnel.



## **AMERICAN ZINC, LEAD AND SMELTING COMPANY**

Buyers of Zinc Concentrates  
Suitable for Smelting in Retort  
and Electrolytic Smelting  
Plants, also Buyers of High  
Grade Lead Concentrates.

*Address Communications to Ore Buying  
Department*

Paul Brown Building  
ST. LOUIS, MISSOURI

927 Old National  
Bank Building  
DUMAS, TEXAS      SPOKANE, WASHINGTON

## **Bunker Hill Smelter**

Owned and Operated by

**Bunker Hill & Sullivan  
Mining & Concentrating  
Company**

Location: KELLOGG, IDAHO  
(R. R. Station: Bradley, Idaho)

Purchasers of GOLD, SILVER and LEAD Ores.  
Producers of "Bunker Hill" Brand of Refined Pig Lead,  
Refined Gold, Refined Silver, Antimony Metal, Anti-  
monial Lead, and Cadmium Metal.

*For information regarding Ore Rates, Address*

**BUNKER HILL SMELTER**

**KELLOGG, IDAHO**

CONSIGN ALL SHIPMENTS to BRADLEY, IDAHO

## **International Smelting and Refining Co.**



*Buyers of*

**Gold, Silver, Copper, Lead,  
Zinc Ores and Concentrates**



**ORE PURCHASING DEPARTMENTS**

**MIAMI, ARIZONA**

**818 Kearns Bldg.  
SALT LAKE CITY, UTAH**



**Copper Smelter  
MIAMI, ARIZONA**

**Lead and Copper Smelter  
TOOELE, UTAH**

## **MAGMA COPPER COMPANY**

*Buyers of*

**COPPER, GOLD  
AND SILVER ORES**



**MINES AND SMELTER AT  
SUPERIOR, ARIZONA**

## precipitates—CENTRAL and EASTERN

### Calumet & Hecla Active In Wisconsin Zinc Field

In southwestern Wisconsin, near the town of Shullsburg, the Calumet & Hecla Consolidated Copper Company is actively engaged in work preparatory to the start of 600-ton daily zinc production next September.

Production will be taken from four deposits to be operated as a single mine through one central shaft. To this end, a two-compartment shaft is now being sunk to a depth of 325', an adequate depth for mining the shallow orebodies which lie some 300' below the surface.

During the shaft sinking operations, another crew has been dismantling the mill purchased from the War Assets Administration last summer. Built during the war to treat tailings, the mill is being moved from its present location some 30 miles distant to the company's property, where it will be erected next to the shaft.

The mill site has been cleared and is ready for the start of construction. Some of the mill equipment already has arrived at the property, and additional machinery shipped from Calumet is in the shops for reconditioning.

### New \$400,000 Tin Smelter Going Up in New Jersey

Construction of a new \$400 thousand tin smelter for the Vulcan Detinning Company is under way at Sewaren, according to an announcement by the Wigton-Abbott Corporation, Plainfield, New Jersey.

The smelter, with an initial capacity of five tons of refined tin daily, will utilize a new process for the extraction of tin from low-grade Bolivian concentrates.



It is reported that *Tri-State Zinc, Inc.*, operating in Jo Daviess County, Illinois, is planning to erect a 1,200-ton capacity mill in addition to its 600-ton flotation plant now in operation. Present large-scale operations by the company include: Production activities at the *Bautsch* mine, where a second shaft 291' deep was recently completed; development work at the

*Gray* mine, Galena, Illinois, and clean-up work and underground core drilling at the old *Black Jack* property which the company unwatered last summer.

The *Eagle-Picher Mining and Smelting Company* is erecting a 1,200-ton capacity mill at its newly discovered *Graham-Snyder* ore body north of Galena, Illinois. The mill will handle the output from the new deposit, said to show indications of more than a million tons of ore, as well as from smaller producers in the district. At present, the company is completing the sinking of two shafts on the property.



According to an announcement by the War Assets Administration, the *Aluminum Company of America* will purchase the government-owned aluminum plant at Massena, New York, for \$5,000,000, at the same time making available to the industry all of its alloy patents and its most important process and fabricating patents without any reciprocal obligations. The agreement also provides for the sale to Alcoa of certain carbon-producing equipment from the government's Burlington, New Jersey plant for \$175,000. WAA, in turn, will purchase from Alcoa for \$115,000 a license under all of the company's machine patents applicable to World War II aluminum production.

Exploratory drilling has been suspended by the *Republic Steel Corporation* at the old *Caledonia* iron mines site, near Spragueville, New York. Approximately 20 holes had been drilled, and several hundred feet of cores had been sent to be assayed at Mineville, where Republic has extensive holdings.



A new plant to treat lean iron ore by the use of jigs is being constructed by the *Charleson Iron Mining Company* near Virginia, Minnesota. Present plans call for completion of the plant by the start of the 1949 shipping



### MILLING STEPPED UP AT RUTH MINE

Milling operations are being stepped up to 500 tons daily at the Ruth mine, the Missouri operation of *Park City Consolidated Mines* at Fredericktown, Mo. Carl V. Stehle, New York City, president, announced recently that the company now has ore reserves in excess of 500,000 tons, sufficient to keep the mill in operation for five years. The property's new deposit is 1,000' long by 600' wide and varies from 8 to 12' in thickness. The ore is expected to average 3.833 percent lead. Prospecting and drilling are continuing, meanwhile, on two additional tracts. The 500-ton flotation mill building is shown on the left, right of which is the coarse ore bin with the headframe and hoist house on top.

season. The new plant will treat lean ore from two stockpiles at the *Misabe Mountain* mine on the Mesabi Range, which concluded shipments about November 20, aggregating an estimated 825,000 tons.

Plans of the *North Range Mining Company* to dewater the *Warner* mine near Amasa, Michigan, have been delayed because of the acute shortage of water for hydroelectric power production on all the Lake Superior iron ranges. Officials of the Wisconsin-Michigan Power Company were unable to say just when power for the pumping could be supplied, although hopes are for not later than this spring. Meanwhile, the company is conducting diamond drill work at the property to determine the extent and limits of ore body.

*Butler Brothers* of St. Paul, Minnesota, have started a busy winter program on the Mesabi iron range which includes about four million cu. yds. of stripping at the *Patrick* group, the *Galbraith* group and the *South Agnew*, with a smaller amount to be moved at the *Argonne* mine. In addition, the *Hoadley* mine washing plant is to be dismantled and the steel, with some of the machinery, will go to the *South Agnew*, where it will be used in the construction of a washing plant. Concrete footings for the hoist, screen plant and washing plant already have been poured.

The hoist, which will operate two 25-ton capacity skips, will be driven by a 1,250 hp. motor and installed in a separate hoist house.

To avoid delays when railroad cars are not available, the *Oliver Iron Mining Company* has constructed a "surge crater" about 60' deep and with a 25,000-ton capacity at its *Spruce* iron mine near Eveleth, Minnesota. When cars are available, the ore comes from the *Spruce* pit over a 30" conveyor belt 1,560' long to a loading pocket on the surface and thence to cars. When there is a delay in car service, the ore will be transferred from the main conveyor belt by a 7½' shuttle belt to the stacker conveyor which will carry the ore to the crater. Ore can be dropped from the bottom of the crater to a pan feeder and returned to the main conveyor for transfer to the surface loading pocket and railway cars.

A steel headframe is being erected for the *Jones & Laughlin Ore Company's* recently completed *Vicar* shaft at Wakefield, Michigan. The headframe will be the most easterly structure at an active mine on the Gogebic iron range.

The *Douglas Mining Company* is now actively stripping the *Duncan* underground iron mine at Chisholm, Minnesota. The *Duncan* is a state fee property which adjoins the *Douglas* mine on the east.

At the *Hill-Annex* mine, Calumet, Minnesota, the *Inter-State Iron Company* is planning to replace units No. 1 and 2 of its three unit washing plant with a heavy media unit that will treat lower-grade ores from the pit and stockpile. The No. 3 unit, the last to be installed, will remain to handle straight wash ores. The changeover is planned for the winter of 1949-50. Meanwhile, large-scale tests on low-grade ore samples are being conducted at the mine and in the *Jones & Laughlin* research laboratory at Negaunee, Michigan. An extensive sampling program is under way in the *Hill-Annex* pit to obtain representative samples. Results of these tests will determine the flow sheet and equipment required for the new unit.

*Butler Brothers' South Agnew* mine belt-conveyed stripping on Minnesota's Mesabi Range is finished for the season; however, the big dragline is still loading some surface material which is being hauled to the dump by trucks. The dragline drops its load into the movable pocket as during the summer, but the feeder from the pocket delivers the dirt to trucks instead of to the belt. The 1150B dragline, which had been increasing its yardage each month, reached a peak in October when it moved 774,076 cu. yds., a daily average of 24,970 cu. yds.

For the BEST  
in GRINDING MEDIA come to the  
**AMERICAN  
FORGE COMPANY**

Forged Steel Balls  
HEAT TREATED

Alloy Steel Balls  
Also Furnished

SEND FOR PRICE LIST

**AMERICAN FORGE CO.**

EXECUTIVE OFFICES  
Latham Square Building - Oakland 12, California  
PLANTS AT  
Berkeley, California and Niles, California

for faster, better service  
in the NORTHWEST, it's



**INDUSTRIAL  
AIR PRODUCTS  
COMPANY**

independently owned  
and operated . . .

**OXYGEN &  
ACETYLENE  
GAS . . .**

**COMPLETE LINE  
OF FAMOUS MAKE  
WELDING  
SUPPLIES**



IN PORTLAND  
3200 N.W. Yeon  
Capitol 1821



IN SPOKANE  
E. 4230 Trent  
Lakeview 1595



IN MEDFORD  
P.O. Box 1506  
Phone Medford 2258

## precipitates — NORTHWEST

### Bunker Hill Buys Lucky Boy Group Near Mullan

Purchase of the Lucky Boy group of 31 lead-zinc claims near Mullan, Idaho, in the eastern Coeur d'Alene mining district has been announced by J. B. Haffner, manager of Bunker Hill & Sullivan Mining Company.

According to Haffner, the property was purchased because of its advantageous position, and no immediate plans have been made by the company for developing it. The Lucky Boy adjoins Pilot Silver Lead Mines on the west, the Snowstorm copper mine on the east and Idaho Silver on the south.

Development work at the property consists of 5,020' of tunneling and some open cuts, all done in the past by hand mining methods.

### First Domestic Monazite Sand Shipped From Idaho

The first domestic shipment of monazite sand, principal source of thorium, was made recently by Rare Earths, Inc., from deposits at McCall, Idaho, to the West Chicago refinery of Lindsay Light and Chemical Company, according to Charles Lindsay, president.

The Idaho deposits, which are said to be sufficient to meet the full needs of the country at present, have never been worked commercially until now. Monazite sand previously was imported from India or Brazil; however, India now has embargoed virtually all such shipments.

Lindsay said his firm has contracted a sizable tonnage of the sand from Idaho. Sales of thorium salts require licensing by the AEC although the commission itself is not an interested purchaser at present.

### Montana Lists Resources In Event of Emergency

Under the direction of the Industrial Division of the state Chamber of Commerce, Montana has completed an inventory of industrial resources to be used in the event of a national emergency.

Believed to be the first state to undertake such a task, Montana started compiling the data after consultation with the National Munitions Board and National Research Board.

Nine "task forces" were designated to inventory the various resources which also included manpower. The mining and smelting committee was

headed by A. V. Taylor, Jr., president of the Mining Association of Montana.

### Annual M. I. I. to Meet at U. of Wash. in January

The 22nd annual Mineral Industry Institute, sponsored by the School of Mineral Engineering, will be held on the University of Washington campus on January 20.

This year the Institute will be a symposium on industrial fuels, and men prominent in Northwest industry will address the group on the subjects of electricity, gas and coal in the area. Discussions also will be held on the special problems involved in the application of fuels to specific industries.

The evening meeting of the Institute, held jointly with the North Pacific section of the A.I.M.E., will be at the university faculty club.



The Spokane-Idaho Mining Company, operating the old Constitution mine in the Pine Creek district of the Coeur d'Alenes, is preparing to sink the main shaft from the 1,000' to the 1,600' level. Meanwhile, exploration of the 1,400' level is being accelerated by drifting in ore. The 1,200' and 1,400' levels are now being serviced by a winze from the 1,000' level.

Better ore showings and an improved labor situation are reported at the Jack Waite mine in the Eagle district of the north Coeur d'Alenes, being operated by the American Smelting and Refining Company under a 40-year profit-sharing agreement. At present, the mine is said to be making \$7-\$8 thousand monthly, with 17 men employed. Production figures are expected to show a decided improvement over the 3,649 tons mined in 1947 which had an average lead content of 64.10 percent and 10.16 percent zinc. Crude ore running as high as 78 percent lead is now being shipped from the mine. E. C. Gaumnitz of Seattle, secretary-treasurer, said.

High-grade lead ore is persisting in the new vein recently opened by Golconda Lead Mines of Wallace, Idaho. Since opening the vein, the company has been drifting east on high-grade, showing a maximum

width up to 10', with a 2' width of solid high-grade crude lead ore on the footwall and about 12' of the same grade on the hanging wall. From this tunnel drive development, more than 2,000 tons of high-grade ore has been stockpiled. Golconda has about 300' easterly to go on the strike before the development enters Square Deal ground.

Lessees operating the Silver Cable mine east of Mullan, Idaho, are reported to have delivered about 1,000 tons of ore to the Golconda custom mill for treatment.

The Lucky Friday Silver-Lead Mining Company now has a stockpile of several thousand tons of ore which is expected to net the company more than \$100 thousand. The ore is a reserve against the expense of sinking the main shaft to the 2,000' level this winter.

David E. Watson, general manager for Thomas Consolidated Mines, Wallace, Idaho, reports that the 500'-level crosscut is now in a highly bleached zone and believed to be approaching a structure opened by surface prospecting. Seven men are currently employed at the property in Nine Mile Canyon, north of Wallace, with Alex Pugh as mine superintendent.

With necessary equipment purchased and buildings to house this equipment under construction, the New Rainbow Mining Company is starting active development of its No. 4 property in the western section of the Coeur d'Alenes in Idaho. Included in the proposed development campaign is a contract for a 1,000' tunnel and drift work. Company Secretary H. Polwarth of Spokane said a 700' to 800' crosscut is expected to tap the vein 400' below an oxidized vein capping 20' wide, uncovered by bulldozing.

C. O. Dunlop, president of the Silver Dollar Mining Company, Wallace, Idaho, reports that a 1,000' raise will be driven in the Chester vein system on the dividing line between Silver Dollar and Silver Chieftain properties. Starting on the 2,800 level, the raise will be driven to connect with the 1,800 level, providing better air conditions for the lower workings. The company owns one-third interest in the Rotbart area, being mined by the Sunshine Mining Company.

Purchase of the Jumbo group of claims and the neighboring Lockport claim has been announced by the Nabob Silver-Lead Company, operating in the Pine Creek district. The Crystallite vein system, now being explored by Nabob from its deep



# Cummins Diesels Save Fuel



**Compare the cost! Operate a Cummins Diesel**  
alongside other engines—diesel, gasoline,  
or butane—then check your fuel bills.  
**Here's what our customers report:**

*Annual Savings:*  
**\$2620<sup>00</sup>**

Yearly fuel costs for a Cummins-powered truck used on an off-highway haul, consisting of three 22-mile round trips per day, are \$2620.00 less than the fuel costs for a gasoline-powered truck used on the same haul. That's because the Cummins-powered truck shows a daily fuel cost of \$3.47 against \$13.55 per day for the gas job.

*Annual Savings:*  
**\$1138<sup>80</sup>**

Yearly fuel costs for a Cummins-powered earth mover on a multi-million-yard earth-moving project are \$1138.80 less than the fuel costs for an earth mover powered by another make of diesel and doing similar work. That's because the Cummins-powered unit, while making more trips and carrying heavier loads, uses only 25.7 gallons of fuel per shift against 33.5 gallons per shift for the other diesel.

Cummins Engine Company, Inc., Columbus, Indiana.

For a complete explanation of the Exclusive Cummins Fuel System and how it can cut your fuel bills, write your Cummins Dealer listed below for Bulletin 5275.

#### SEE YOUR CUMMINS DEALER

CUMMINS SERVICE & SALES	1661 McGarry St., Los Angeles, California, Tel. Prospect 1026
WATSON & MEEHAN	1960 Folsom St., San Francisco 3, California, Tel. Market 1-8930
CUMMINS INTERMOUNTAIN DIESEL SALES COMPANY	1030 Gale St., Salt Lake City 11, Utah, Tel. 9-3768
CUMMINS DIESEL SALES OF OREGON, INC.	1225-35 Southeast Grand Ave., Portland 14, Oregon, Tel. EAst 7146
CUMMINS NORTHWEST DIESEL SALES	2717 First Ave., South, Seattle 4, Washington, Tel. Main 3870
CUMMINS DIESEL SALES OF SPOKANE	South 155 Sherman St., Spokane 5, Washington, Tel. Main 5460
CUMMINS & MORAN	426 W. Madison, Phoenix, Arizona, Tel. 4-4040
CUMMINS DIESEL SALES OF IDAHO, INC.	207 S. Capitol Blvd., Boise, Idaho, Tel. 3783

## ALLISON STEEL MANUFACTURING COMPANY

Mine and Mill Buildings • Mine  
Rails • Ore Cars • Steel  
Gallows Frames • Ball Mills  
Muck Plates • Crucible Drill  
Steel

-----

● We offer a complete repair  
service to the Mining Indus-  
try. Our new Machine Shop is  
equipped to handle your work  
quickly and economically.

*Hot Milling of All Types of  
Detachable Bits*

**SOUTH 19th AVENUE  
PHOENIX ARIZONA  
PHONE 3-5161**

## NEW STEEL PIPE

**4" - 14 GAUGE**

20' Lengths with Quick Couplings  
Sturdy pipe economically priced. Suit-  
able for permanent or portable industrial  
lines. Quick and easy to assemble.

24" Diameter

### New Galvanized Armco CORRUGATED CULVERT

Half-rounds, 26" long, side flanged and  
drilled for bolting into circular pipe.  
Bolts included. 2-inch overlap for joints.  
Makes continuous culvert in multiples  
of 2 feet.

### Reconditioned PIPE VALVES FITTINGS

High quality,  
clean, straight,  
rethreaded, as-  
phaltum dipped,  
pressure tested.  
Thirty pipe with  
years of service.

WRITE FOR QUOTATIONS,  
STATE FEET REQUIRED

### PACIFIC PIPE COMPANY

407 FOLSOM ST. • SAN FRANCISCO 5

level crosscut, reportedly outcrops on  
the Jumbo claims. Nabob recently  
completed its 6,400' crosscut tunnel  
and now has advanced more than 50'  
on the Crystallite vein.

Progress of 10' per day on a two-  
shift basis is reported by *Hope Silver-  
Lead Mines, Inc.*, Clark Fork, Idaho,  
in driving a crosscut to the Elsie K  
vein from the 700 level. Meanwhile,  
the old workings are producing from  
60 to 65 tons of ore daily for milling.

The *Signal Mining Company*, which  
holds an option on the old *Hilarity*  
property on Pine Creek, is making  
plans to sink the shaft from the 200  
to 500 level. Robert E. Brown, Min-  
ing Exchange Building, Kellogg, is  
company president.

An electric cable is being strung  
2,000' underground by the *Lookout  
Mountain Mining Company* at its  
property in the Pine Creek district.  
The cable will connect with a shaft  
station from which new shaft work is  
planned.

*Silver Crescent, Inc.*, Wallace,  
Idaho, is now cutting a station on the  
600' level of its *Dickens* mine, pre-  
paratory to sinking a winze on the  
recently uncovered showing of lead-  
silver-zinc ore on that level. A hoist  
is being installed, and actual sinking  
will be started shortly. Owner of a  
200-ton mill, the company expects to  
begin production when sufficient ton-  
nage is developed.

Bulldozing operations by the *Silver  
Buckle Mining Company*, Wallace,  
Idaho, have uncovered several zones  
of bleaching, considered a favorable  
indication in the *Coeur d'Alene* dis-  
trict. Present work is being carried  
out near the eastern end of the com-  
pany's property, adjacent to the *West-  
ern Silver-Lead* and *Rock Creek*  
companies. Upon completion of this  
work, the bulldozer will be moved to  
the western end of the property,  
where further operations will be con-  
tinued.

MONTANA

The *Federal Mining & Smelting  
Company* has now cleared and re-  
timbered for a distance of 1,800' the  
old *Iron Mountain* tunnel at Superior,  
Montana, which it will examine with  
the possibility of resuming mining  
operations.

Shipments of high-grade fluorspar  
are now being made by lessee *Jay  
Bettles* from the property of *Coeur  
d'Alene Extension Mines, Inc.*, near  
Superior, Montana. A vein of high-  
grade mill ore is being developed in  
conjunction with the mining, and a  
mill is planned in the spring if the  
vein warrants it. To determine the  
extent of the orebody, a 100' tunnel is

also being driven to intersect the vein  
at depth. Eight men are employed in  
the open-pit operation.

At the *Saranac Mining Company's*  
operation, Maxville, Montana, higher  
grade ore is being mined from three  
shoots for shipment direct to smelters,  
while milling operations are being  
stepped up. *Saranac's* main ore struc-  
ture is said to range from 25 to 55'  
in width, and top slicing and caving  
methods will be used, with 50' heights  
broken and mined. Known ore re-  
serves are said to indicate three to  
five years of milling at the capacity  
rate of 100 tons daily. C. B. Hoskins  
is general manager.

OREGON

A new bauxite area of undeter-  
mined extent has been found in  
Clackamas County by the Oregon  
Department of Geology and Mineral  
Industries. The discovery was made  
after a sample of ferruginous bauxite  
pisolites was submitted to the De-  
partment for a mineral determina-  
tion. Reconnaissance work by the  
Department so far has shown oc-  
currences extending over a lineal  
distance of about a mile on the  
southwest side of the Clackamas  
River, some 35 miles southeast of  
Portland.

WASHINGTON

According to an announcement by  
the War Assets Administration, the  
*Pend Oreille Mines & Metals Com-  
pany*, operating in the Metaline dis-  
trict of Washington, has exercised its  
option for a five-year lease on por-  
tions of the former *Mead magnesium*  
plant, east of Spokane. The lease was  
first given to the company for a  
period of six months to test a new  
zinc reduction process.

Directors of *Glacier Silver-Lead  
Mining Company* have organized the  
*Sunny Peak Mining Company* to  
take over and develop the *Gubser*,  
*Mineral Hill* and *Mohawk* properties  
which *Glacier* has acquired near  
Conconully, Washington. First work  
to be undertaken will be extending  
the 800' *Gubser* tunnel some 200' for  
exploratory purposes. This tunnel,  
started in 1903, can be extended  
10,000' to cut the more distant veins  
at a depth of 3,000', it was said.  
*Charles J. Weller* of *Coulee City* is  
president of *Glacier Silver-Lead*,  
which formerly operated the *Lukens-  
Hazel* and *Ambassador* mines in  
Montana.

MINING WORLD

## precipitates — SOUTHWEST

### Mining Firm Incorporated In Ariz. for \$1,000,000

A new million dollar firm, the Bonanza Mining Company, was recently formed by 57 residents of Superior to develop seven high-grade copper claims north of Wenden, Arizona.

Worked on a small scale for a number of years by Roy R. MacDonald, president and general manager of the new corporation, the property will now have its first real chance to become a large-scale producer.

At present, four diamond drill holes are being put down to a depth of 600' to prove an area 1,000' in length. If existence of the expected deposits is established, extensive mining operations will be undertaken in the near future.

### Kennecott Prepares for Open-Pit Mining at Ray

Preparations for the semi-conversion to open-pit mining are being pushed by the Ray Mines Division of Kennecott Copper Corporation, Ray, Arizona, which has now completed diversion of the flow of surface water in Copper Canyon. This was accomplished by cutting a channel and building a dam which will permit the seasonal flow of water to be discharged into another canyon outside the ore zone.

Meanwhile, Ray is producing about 6,000 tons of ore daily from underground operations. When maximum production is possible from the pit, this underground tonnage will be reduced and supplemented with pit tonnages to make a combined production of 15,000 tons daily.

### Production to Be Resumed At Arizona's Golden Door

Necessary machinery, milling equipment and labor are being obtained for the resumption of large-scale production activities at the Golden Door mine north of Kingman in northwestern Arizona.

Huge quantities of gold ore are said to be in sight for immediate production. In addition, a high-grade strike was made recently, averaging \$60 a ton. Present development of this vein shows an average width of 5', although the length has not yet been ascertained.

The Golden Door was producing 100 tons of gold ore daily in 1942 when the wartime order suspended operations. Bulldozers and a dragline were used in the open-pit operation on a

flat lenticular vein, lying near the surface.

Available for immediate mining is a mammoth orebody protruding from the side of the mountain. More than 40' wide, this ledge has been exposed by erosion to give indications of containing substantial amounts of ore. Other orebodies discovered on the property still await development.



The United States Smelting Refining and Mining Company has decided to liquidate and remove the remaining equipment underground and its mill and surface plant at the Goldroad mine, due to the high cost of maintaining the property and high taxes. Because of the remoteness of obtaining relief from high costs of labor and materials, it is impossible to mine the low-grade ores economi-

cally. As the greater part of this equipment will no doubt become obsolete before operations can be resumed, it will be disposed of.

The newly organized Yarnell Consolidated Mines has taken a long-term lease on the flagstone quarries, nine miles north of Perkinsville, Arizona. Thomas Stoelting, chief engineer, said necessary equipment has been secured so that the company will be able to fill both local and out-of-state orders. The property is owned by A. C. York of Yarnell.

J. E. Dietrich, 17 East Figueroa, Santa Barbara, California, and associates are reported to be preparing a 250-ton mill to handle ore from the old Castle Dome lead properties in Yuma County, Arizona. When the mill is ready for production, the operators propose to lease blocks of ground to various groups and handle ore from all the leases at the plant. Past production from the district is estimated at close to \$1,000,000.

Harwood Mines, Inc., is sinking a new one and a half compartment shaft for further development of the lead-



### COMBINED METALS EXPANSION

In Lincoln County, Nevada, Combined Metals Reduction Company is expanding its mill capacity, mine production, development and exploration, with the result that employment will be increased from the present 350 men to a crew of approximately 500. According to Sam S. Arentz, manager of the operation, the company's Caselton mill is currently treating about 1,000 tons of lead-zinc ore daily, mined from the Caselton, Prince, Ely Valley and Comet properties in the Pioche area. The above recent photo shows a general view of the surface plant at the Caselton shaft.

**TOPS... for REPOINTING  
SHOVEL and DIPPER TEETH  
MANGANAL**

TRADE MARK REGISTERED U. S. PATENT OFFICE

11% to 13½% MANGANESE-NICKEL STEEL

**WEDGE BARS**

Regardless of the analysis of the parent metal Manganal 11% to 13½% Manganese-Nickel Steel Wedge Bars can be used to do a more economical and more efficient job. Due to its high tensile strength, toughness and work hardening under impact and abrasion it will last longer. Manganal Bars come in 22 sizes to fit any tooth size. Try them once—you'll always use it!

NAME OF NEAREST DISTRIBUTOR UPON REQUEST

Write For Your Free Copy of the "Manganal Marketer"

**STULZ-SICKLES CO.**  
Sole Producers  
91 N. J. Railroad Avenue, NEWARK 5, N. J.

**SuperDuty  
DIAGONAL DECK  
No. 6  
CONCENTRATOR  
TABLE**

SPACE-SAVING *SuperDuty*  
HANDLES MORE NEW FEED PER DAY

SuperDuty Diagonal Deck Tables increase the productivity of your concentrating section by the simple expedient of reducing the circulating load.

By placing 75% more working riffles in the path of material flow, SuperDuties fan out the products for more accurate cutting. The results are higher grade concentrates, leaner tailings and fewer middlings for recirculation. This means more tons of new feed per day.

Write for Bulletin 118A

**THE DEISTER CONCENTRATOR CO.**  
The Original Deister Co., Incorporated 1906  
925 Glasgow Ave. Ft. Wayne, Ind., U. S. A.

**COUNTY MAPS**

For Schools, Hunters, Fishermen, Public Offices, and Travelers

CALIF.: with Townshp., Rng., Rec., Mines, Roads, Trails, Streams, Lakes, R. R., Schools, Rngr. Sta., Elev., Nil. Forest, Pwr. Lines, Canals, Boundaries, etc.

Sizes: 20 x 30 to 73 x 100 inches

Alameda, Alpine, Amador, Butte, Calaveras, Colusa, Contra Costa, Del Norte, El Dorado, Glenn, Kings, Lake, Marin, Mariposa, Merced, Napa, Nevada, Orange, Sacramento, San Benito, San Francisco, San Joaquin, San Mateo, Santa Clara, Santa Cruz, Sierra, Solano, Sonoma, Stanislaus, Sutter, Ventura, Yolo, Yuba—each \$1.

Fresno, Kern, Riverside—\$2.50 - \$5.  
Los Angeles—\$1 and \$3.  
Siskiyou—\$2 and \$4.  
Inyo County, \$15; E or W, \$7.50; San Bernardino, 73 x 110, \$15; No. or So. ½, \$7.50; NW, SW, NE, or SE ¼, \$3.75.

Tulare, Tehama, Imperial—each \$2.  
San Diego, Mendocino, Humboldt—\$2.50.  
Trinity, Shasta, Mono, San Luis Obispo, Monterey, Lassen—\$3.

Also Oregon, Idaho and Washington County Maps.

**WORLD'S MINERALS**

2417 San Pablo Avenue  
OAKLAND 12, California  
Templebar 2-3870

silver orebody at the *Sein Fein* mine, near Aravaipa, Arizona. Five men are employed in the work under the direction of R. A. Fointer, Klondyke, manager.

*Summit Copper Mines, Inc.*, which owns one patented and 17 unpatented copper claims northwest of Payson, Arizona, is contemplating installation of a 30-ton concentrating mill in the near future, according to R. W. Thompson, general manager.

Permission has been granted the *C. I. L. Mining Corporation*, 214 West Turney Avenue, Phoenix, to sell 50,000 shares of \$1 par value stock for the development of its *Poncho* group of lode claims in the Cobabi mining district of Pima County, Arizona. While only shallow development work has been attempted at the group, several properties in the vicinity are said to have been producers of high-grade silver ore. So far as opened, the vein at the *Poncho* averages about 30", with quartz lenses and limonite filling. Chief values are in silver, gold and copper. Company officials include: H. W. Long, president; B. H. Callahan, vice-president and in charge of mine development, and Fred Ingersoll, secretary-treasurer. The executives and officers will receive no salaries or compensation until the mine is on a paying basis.

Shipments of silicious low-grade silver ore are being made from the *Silver Reef* mine, southwest of Casa Grande, Arizona, to the *Hayden* smelter. The ore is being extracted from the surface, following drilling and blasting. The value of the material as flux makes the operation a profitable one for *Sherwood B. Owens* of Tucson, who holds the lease.



*Idaho-Maryland Mines Corporation* has confirmed reports of a new gold vein at its *Idaho* mine at the eastern end of Grass Valley, California. According to Neil O'Donnell, executive vice president and general manager, ore from the new discovery now being milled is running \$10 a ton, higher than ore previously mined. Crosscutting has found the vein to be 40' wide, although little is known as yet as to the length of the ore shoot.

Good progress is reported by the *Atlas Mining Company* at the *Lockwood* mine, four miles northeast of West Point, California. The shaft has been sunk to a depth of 150', and the operators are now drifting along the new vein. Core drilling is also under way to test two parallel veins, reported to contain high-grade ore when first drilled in 1932. Harry E. Briggs is company president.

A. C. Lambert of Barstow, Cali-

**MINING WORLD**

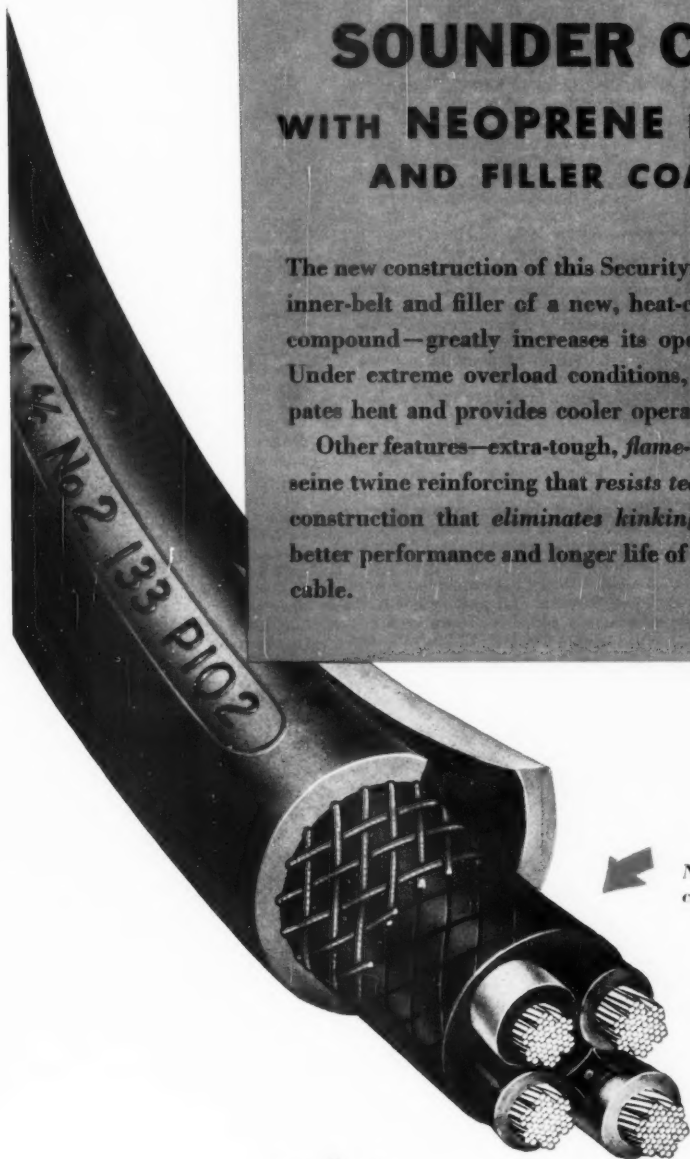


# A SAFER, SOUNDER CABLE

## WITH NEOPRENE INNER-BELT AND FILLER COMBINED

The new construction of this Securityflex cable—combined inner-belt and filler of a new, heat-conducting Neoprene compound—greatly increases its operating safety factor. Under extreme overload conditions, the inner-belt dissipates heat and provides cooler operation.

Other features—extra-tough, flame-resistant outer jacket, seine twine reinforcing that resists tearing and engineered construction that eliminates kinking—contribute to the better performance and longer life of this new Securityflex cable.



New inner-belt construction operates cooler under extreme overloads



**ANACONDA**

*Securityflex* **CABLE**

fornia, is preparing to start shipments of lead-silver ore from the *Old Liz Bonanza* property, northeast of Barstow in the Williams Well district. Lambert also reports discovery of a copper-gold-silver vein at the *Old Liz Copper* group in the same district.

**Mining Men Prefer**

## HOTEL SPOKANE

At The Spokane they enjoy all the comforts afforded by this friendly Inland Empire hotel.

WM. L. ELSLIE, Mgr.

"Home of the famous  
Silver Grill"

First and Stevens in Spokane  
(Garage across the street)

## W. A. PLUMMER MANUFACTURING COMPANY

Established 1900



**Cloth Bags  
Canvas Products**

Special Industrial Fabrics  
For All Phases of the Mining Industry  
752 S. San Pedro St., Los Angeles 14, Cal.

**FEDERAL  
PIPE &  
TANK  
CO.**

**—WOOD PIPE and WOOD TANKS—**

Factory  
and Main Office  
6851 E. Marginal Way  
Seattle 8, Wash.

PROSPECTORS, Engineers . . .  
For You, the

### CHICO PAN

the pocket-size gold pan used  
for sampling and panning.  
Chrome-Nickel Stainless Steel  
Sent Postpaid for \$2.00

Write: A. O. BARTELL  
Mining Engineer  
521-E Platt Bldg., Portland 5, Ore.



The *New Champion Mining Company*, which for the past 2½ years has been developing the *Centennial* mine at West Point, California, plans to sink its main shaft to the 425' level, with drifts on the 300' and 400' levels by April 1. At the present time, the shaft is down to the 235' level, and 700' of drifting has been done on the 200' level. During the past season, the company installed a new 125-kw. generating plant and a 35-ton Hendy ball mill with an eight-cell flotation unit.

A new copper operation is forecast at the *Siskiyou* mine, 20 miles from Happy Camp, California, where *Siskiyou Mines* has just completed a new \$50 thousand access road. First discovered in 1935 when a forest fire burned off heavy brush hiding the outcrop, the property had remained unworked because of the inaccessibility of the region. Now, necessary equipment and machinery have been installed, and the *Siskiyou* company is reported to be planning a power-shovel mining operation if present exploration and development prove satisfactory.

Installation of equipment has been completed at the *Crystal Springs* lead mine near Tecopa, Inyo County, California. The property is being leased by Frank W. Mackey, who is now re-timbering the old workings preparatory to the resumption of mining activities.

J. A. Shields has employed a small crew to clean out and re-timber his *Josephine* mine at Volcanoville in El Dorado County, California. Rehabilitation work will continue through the winter. The property is opened by a 1,300' tunnel and has 3,000' of workings.

Early production of gold-copper ore is reported to be planned by the *Vivian Mining Company* at its leased *Pine Hill* mine in the Wolf district, southwest of Grass Valley, California. Walter Hoppe is mine superintendent, and Bert Austin of San Francisco is consulting engineer.

NEVADA

Purchase of the Westgate mill between Fallon and Austin, Nevada, on U. S. Highway 50 has been announced by the *Broken Hills Mining & Milling Company* of Hawthorne. According to company officials, the plant will be reconditioned and placed in operation at an early date to treat ores from the company's property at Broken Hills in the northeastern part of Mineral County. Prior to the consummation of the Westgate mill deal, the company had planned to erect a new 100-ton capacity plant in the Gabbs district where water is available.

*Consolidated Chollar Gould & Savage Mining Company* is currently milling 575 tons of gold ore daily at its property at Virginia City, Nevada. Two shifts are employed in the Overman pit, and an average of 3,000 cu. yds. of material is moved daily. F. V. Dempsey of Virginia City is general superintendent, and Thomas V. Barton, 1122 Kohl Building, San Francisco, is vice-president and general manager.

Arrangements have been completed by W. D. Edds, Claude Ide and Pat Brady for the spring operation of the Kinkead mill near Luning, Nevada. The mill will operate on ores from the old *Pamlico* mine near Hawthorne, where the operators are now working over some old dumps. H. H. Holloway is present owner of the Kinkead mill.

*The Combined Metals Reduction Company*, operator of several perlite deposits in the Pioche district, is constructing a crushing and screening plant for handling larger volumes of perlite at Pioche, Nevada. At present, the crushed and sized perlite is being shipped to an expanding plant at Bauer, Utah, and to Pacific Coast customers.

The *White Caps* mine at Manhattan, Nevada, for many years a consistent producer of gold, is being reopened by the *Tonopah Divide Mining Company* and will be developed for its antimony values. Present work by a crew of four consists of unwatering the shaft to the 500 level so that mining operations can get under way as quickly as possible. The ore will be shipped to a California smelter.

H. H. Cowan and Bruce K. Minard have taken a lease and option on the *Courbet* group of patented claims in the Gold Mountain district of Esmeralda County, Nevada. At present, the new operators are mapping and sampling the property and making milling arrangements. An early producer, the property has value in gold, with some lead and silver. W. E. Patten of Bonnie Clare is the owner.

NEW MEXICO

The War Assets Administration has announced the sale of the surplus *Gila* fluorspar mill at Gila, New Mexico, to the *Barnet Company* of Denver. K. S. Barnett, company owner, said he purchased the plant with the intention of placing it in operation, but it has now been decided to sell the equipment, all in good condition. Included in the sale were 12 acres of land, 12 mill buildings and equipment which originally cost the government \$212 thousand. The plant was designed to produce fluorspar by the sink-float method.

The old Nordstrom property, renamed the Carbonate, in Bear Canyon, nine miles northwest of Winston, New Mexico, is being reopened by Robert Burns, who has employed a crew for development and mining operations. A new hoist and compressor has been installed, and high-grade lead-sulphide and lead-carbonate ore has been encountered at the bottom of the 50' shaft in commercial amounts. Drifting is now proceeding on the vein.

H. E. McCray, who formerly operated the Burro Chief fluorspar mine at Tyrone, New Mexico, has taken

a lease on two adjoining fluorspar properties in the Cook's Peak mining district, north of Deming. Operations were started in November on the Greenleaf group, being leased from the Greenleaf Corporation; development of the adjoining Lucky mine has been under way for several months. The inclined shaft on the latter property has been extended about 50' from the 400' level, where a new fluorspar orebody has been encountered.

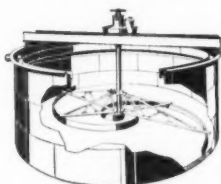
According to general superintendent Allan Bowman, full production activities were resumed recently at the properties of the Banner Mining

Company, six miles south of Lordsburg, New Mexico. The company is operating the Bonney and Misers Chest copper mines, which are equipped with a 500-ton flotation mill.

Donald S. Tedford, mining engineer of Columbus, New Mexico, is conducting further exploration work at the Royal John mine in the Black Range mining district in southwest New Mexico.

New activity by the Empire Mining and Milling Company at its properties in Sierra County, New Mexico, is reported by Percy Wright, consulting engineer of Hillsboro.

## Scraper Breakage is "Out of Style" . . .



## . . . with Hardinge "AUTO-RAISE" THICKENERS

The ingenious Hardinge "Auto-Raise" Thickener drive mechanism automatically lifts the entire scraping assembly upward when an overload occurs anywhere in the tank bottom. Another feature is the double-spiral scraper which removes settled solids rapidly—prevents "pile-ups."

Write for Bulletin 31-D-3 for complete details of this unusual thickener.

# HARDINGE

COMPANY INCORPORATED

YORK, PENNSYLVANIA — 240 Arch St. • Main Office and Works  
NEW YORK 17—122 E. 42nd St. • 205 W. Wacker Drive—CHICAGO 6  
SAN FRANCISCO 11—24 California St. • 200 Bay St.—TORONTO 1

## HEADQUARTERS FOR MINING AND CONTRACTORS SUPPLIES

• GARDNER-DENVER DISTRIBUTORS •



Gardner-Denver Compressors—Portable, stationary, gas, electric.  
Wagon drills, jackhammers, pavement breakers and air hoists.

MARLOW CENTRIFUGAL AND DIAPHRAGM PUMPS  
COMPLETE RENTAL SERVICE ON ABOVE

Personalized Field Service by Experienced  
Mining Men

Timken Bits—Drill Rods Rochester Wire Rope  
Bethlehem Drill Steel Ball and Roller Bearings  
Air Hose—Tackle Blocks V-Belt Drives and Sheaves

## GEORGE M. PHILPOTT CO.

1060 Bryant Street, San Francisco  
Phone HElock 1-5475

OAKLAND  
3257 San Pablo Ave.,  
Phone HUmboldt 3-1656

PORTLAND  
1635 NW Raleigh St.  
Ph. ATwater 9327

## MINING WORLD

with which is combined

MINING JOURNAL

The Production Magazine of the Metal Mining  
Industry

Published at

SAN FRANCISCO, CALIFORNIA

\$3.00 Per Year . . . . . 13 Issues

Includes Mine Development and Directory Number

## WEIGHTOMETER

Use the WEIGHTOMETER for accurate, dependable tonnage controls in mills and concentrators. Since 1908 WEIGHTOMETERS have helped many mines and mills to obtain efficient operation. Automatically records and totalizes without interrupting flow.

Easily installed, simple,  
fully enclosed, durable.

## MERRICK SCALE MFG. CO.

172 Summer Street

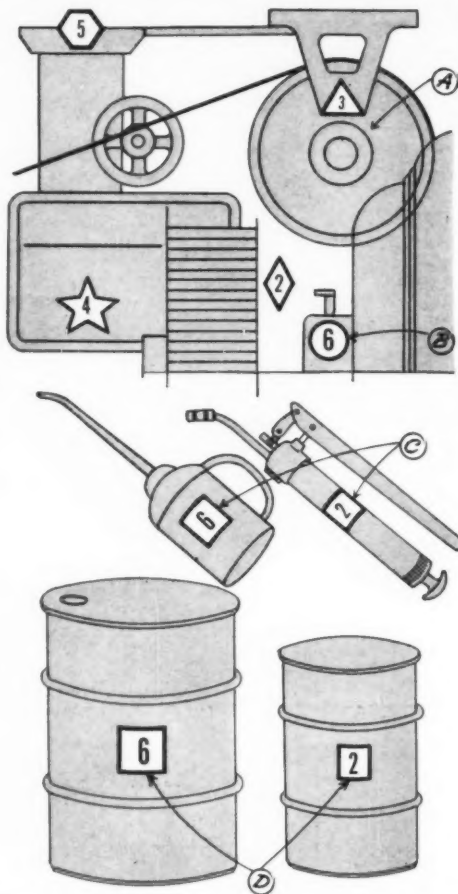
PASSAIC

NEW JERSEY

# STANDARD ENGINEER'S CASE FILE



## Case 1102--Preventing Lubrication Mistakes in Plants and Motor Fleets



Many operators of plants and fleets in the West have practically eliminated operation delays due to improper lubrication or use of wrong lubricants, by installing Standard of California's free, coded system of planned lubrication. The system employs symbols instead of colors to indicate lubrication intervals -- stops mistakes caused by color-blindness, faded colors or changed appearance of color in different lights. Available for plants and fleets in the Seven Western States.

- A. Black-on-white decal symbols show desired lubrication intervals at a glance. Are placed directly on machine at lubrication points.
- B. Numbers on the decals indicate the kind and grade lubricant to be used at each point. Chart card on each machine gives meanings of symbols and numbers.
- C. Lubricant number-decalcs on dispensers identify lubricant in each dispenser and prevent its use in wrong place.
- D. Lubricant number-decalcs on barrels, cans or other storage show kinds and grades of lubricant in stock.

All decals, chart cards and other material for the Standard Coded System of planned lubrication, and installation of the system are free. On request, a Standard Fuel and Lubricant Engineer from Standard Technical Service will survey your plant or other operation any place in the Seven Western States. He will make recommendations, give expert advice and install the Standard Coded System if you desire it.

Trademarks, "Calol," "RPM," Reg. U. S. Pat. Off.

STANDARD TECHNICAL SERVICE will make your maintenance job easier. If you have a lubrication or fuel problem, your Standard Fuel and Lubricant Engineer or Representative will gladly give you expert help; or write Standard of California, 225 Bush Street, San Francisco 20, California.

FOR EVERY NEED A **STANDARD OF CALIFORNIA** JOB-PROVED PRODUCT



MINING WORLD





*"No Loss of  
POWER  
at HIGH  
ALTITUDE"*

**T**HAT'S what drivers for The McLaren Gold Mines Co., Cooke, Montana say of the General Motors Diesels powering their Euclid dump trucks. And they're speaking from really rugged experience.

The mine is at an altitude of 9600 feet. On a haul of  $4\frac{1}{2}$  miles over grades as steep as 16%—these trucks make 8 round trips per 9-hour shift. They work without a whimper—18 hours a day, 7 days a week.

GM Diesels are especially well suited to high-altitude operation because of their

2-cycle design. With power at every piston downstroke, they deliver twice the number of power impulses for each turn of the shaft. A built-in blower provides pressurized "Uniflow" scavenging which assures cleaner, more complete combustion. This gives them plenty of tough, fast-stepping horsepower that's quick to respond to a touch of the throttle.

No matter what your requirements may be, if you want sturdy, money-making power, be sure to look into General Motors Series 71 Diesel engines.

#### **DETROIT DIESEL ENGINE DIVISION**

SINGLE ENGINE: Up to 200 H.P.

DETROIT 28, MICHIGAN

MULTIPLE UNITS: Up to 800 H.P.

**GENERAL MOTORS**



**DIESEL BRAVN WITHOUT THE BULK**

# PROFESSIONAL DIRECTORY

One-Inch Card, \$35 Yearly—1/2-Inch, \$20 Yearly. Payable in Advance.

**ALEXANDER, JOHN L.**  
REGISTERED MINING ENGINEER  
Reports — Examinations — Management  
Mine Operator  
Box 1745 530 W. Latham  
Miami, Arizona Phoenix, Arizona

**Anderson, Richards & Spencer**  
Registered Mining and Metallurgical Engineers  
Box 401 Palmer Building Baker, Oregon

**ARIZONA ASSAY OFFICE**  
CHAS. A. DIEHL  
Assayer and Chemist — Daily Service  
Box 1148 815 N. First St., Phoenix, Ariz.

**ARIZ. TESTING LABORATORIES**  
CLAUDE E. McLEAN, REGISTERED ASSAYER  
Analytical and Consulting Chemist  
Box 1889 823 E. Van Buren Phoenix

## Flotation Reagents

BEAR BRAND XANTHATES  
SUNNY SOUTH D. D. PINE OIL-A

Complete line of all standard flotation reagents, also metallurgical and assay chemicals carried in stock.

**H. J. BARON COMPANY**  
805 Mills Building  
EL PASO TEXAS

ORE SAMPLERS & SHIPPERS' AGENTS

## Beach & Company

Phone 258—P. O. Box 574  
131 E. Eighth St., Leadville, Colo.

Branches at Amarillo and Dumas, Texas.  
All Utah smelters and other places by arrangement. Address all communications to the Leadville office. Oldest, most reliable.

Rates reasonable.

**BENITEZ, ALBERTO TERRONES**  
MINING ATTORNEY  
Office, Calle Tacuba 92, Desp. 28, Mexico City  
(Mining Expert. Registered in the Mines Dept.)  
Title Examinations, Incorporation, Mining, Contracts, Mine and Mining Claim Surveys

## ASSAYERS & CHEMISTS

Shippers' Representatives  
at Smelters for 35 years

Bennetts Chemical Laboratory, Inc.  
1131 Market Street • Tacoma, 3, Wash.

**BERRY, EARLE W.**  
CONSULTING MINING ENGINEER  
Mine Examination, Reports  
Mill and Power Plant Design  
P. O. Box 422 Hayward, Calif.

B. W. DEASON V. E. WORSLEY  
**BLACK & DEASON**  
Assayers and Chemists  
Ore Shippers Represented at all Smelters  
P. O. Box #1898 Salt Lake City, Utah

**F. J. BOODY**  
ASSAYER and MINING ENGINEER  
648 W. Oro Street Tucson, Arizona  
Phone: 6336-W

**CLARK, ADDISON N.**  
Consulting Mining Engineer and Geologist  
Syndicate Bldg., 1440 Broadway, Oakland, Cal.  
ELECTRO-GEOPHYSICAL SURVEYS

**THE COLORADO ASSAYING CO.**  
ASSAYERS, CHEMISTS, and  
SPECTROGRAPHERS  
Est. 1900  
Charges: Gold 75c, Silver 75c, Copper 75c. Send  
for Free Copy of Our Mineralogist's Pocket  
Reference Giving Detailed Information on All  
the Principal Ores.  
2013 WELTON ST., DENVER 1, COLORADO

C. Ivan Nichols Wm. J. Deason  
**DEASON & NICHOLS**  
ASSAYERS AND CHEMISTS  
Supervision of Ore Sampling at Smelters  
160 S. W. Temple St., Salt Lake City 1, Utah

## DIAMOND DRILL

Contracting Company

S. 18 Stone Spokane 15, Wash.

"DIA-HARD" CORE  
BARRELS

AND

DIAMOND DRILLING SUPPLIES

Core and Churn Drill Contractors

THE  
**C. M. FASSETT CO.**

Chemicals and  
Laboratory Apparatus

W. 23 Main Ave. • Spokane 8, Wash.

**R. L. GILMORE, E. M.**  
AND ASSOCIATES — ENGINEERS  
Mining—Petroleum—Chemical—Metallurgical  
Geological Examinations and Reports  
Mine Examinations—Mine Management and  
Operation—Ore Analysis  
GEOPHYSICAL EXPLORATION  
625 E. Broadway Long Beach 2, Calif.

**GOODALL BROTHERS**  
ASSAYERS AND CHEMISTS  
SHIPPERS' REPRESENTATIVES  
Established 1909

Helena

Montana

## HAMILTON, BEAUCHAMP & WOODWORTH

Metallurgical and Mechanical  
Consulting Engineers Ore Testing  
Design, Construction, Operation of Milling  
Plants

564 Market Street San Francisco 4, Calif.

**HANKS, INC., ABBOT A.**  
ASSAYERS AND CHEMISTS  
Supervision of Sampling at Smelters  
Laboratory Ore Tests  
624 Sacramento St. San Francisco

## DIAMOND DRILLING

Core and Blast Hole Contractor

J. L. HAVLICK

1513 W. Second Ave., Spokane 9, Wash.

## HAWLEY & HAWLEY

W. E. HAWLEY, Mgr.

Assayers, Chemists, Ore Buyers  
Shippers' Representative  
P. O. Box 1060 Douglas, Arizona

**HERMAN, JOHN**  
ASSAYER AND CHEMIST  
Complete Qualitative Spectrographic  
Analysis

I Do Not Guarantee Satisfaction  
I Guarantee Accuracy  
920 Santee St. Los Angeles 15, Calif.

## ISHAM & ISHAM

GEOPHYSICAL ENGINEERS

230 Redwood Ave.  
N. Sacramento 15, Calif.

**HERBERT BANKS JOHNSON**  
CONSULTANT


Electrostatic Separation  
Process Developments  
76 Elmwood Ave. Rochester 11, N. Y.

**SHERWIN F. KELLY**  
GEOPHYSICAL SERVICES, INC.

Room 318, 900 Market Street  
Wilmington, Delaware

## LAMBERT-LENT LABORATORIES

Assayers — Chemists — Metallurgists  
Professional Engineers  
Rapid and Accurate Personalized Service  
2232 Third Ave. Phone: Seneca 2224  
SEATTLE, WASH.



Laucks Laboratories'  
**"185 MINERALS and HOW TO IDENTIFY THEM"**  
 is the best guide obtainable.  
**50¢**  
 Per Copy  
 1008 Western Ave. • Seattle

**H. GRATTAN LYNCH**  
 Geologist and Mining Engineer  
 Evaluation, Development, Management  
 Mines and Oil Lands  
 742 Peyton Building  
 Spokane 8, Wash.      2790 Bayside Walk  
 San Diego 8, Calif.

**JOSEPH T. MATSON**  
 CONSULTING MINING ENGINEER  
 Examinations — Appraisals — Operations  
 216 Radio Plaza, P. O. Box 170, Santa Fe, New Mexico

**The MERRILL COMPANY ENGINEERS**  
 Hobart Bldg.      582 Market St.  
 SAN FRANCISCO, CALIFORNIA

**ARNOLD H. MILLER**  
 CONSULTING ENGINEER  
 General Mine, Mill and Industrial Appraisals, Plant Design, Mechanization and Improvement  
 Cable: "AL-MIL" Tel. Cortland 7-0635  
 120 Broadway      New York City 5, N. Y.

**STANLEY M. MOOS**  
 MACHINERY CONSULTANT  
 El Paso, Texas—P. O. Box 321  
 100 Texas St.      Tel. 2-6538  
 CABLE ADDRESS "MOOS"  
 Mexico, D. F.      Apartado 215

**MURPHY, F. M.**  
 Consulting Mining Geologist  
 1201 Maryland Parkway, Las Vegas, Nev.

**RODGERS PEALE**  
 Consulting Mining Geologist  
 315 Montgomery St.      San Francisco 4, Calif.

**Scientific Supplies Co.**  
 COMPLETE STOCKS  
 ASSAY EQUIPMENT • CHEMICALS  
 Your orders and inquiries are assured  
 of prompt and courteous attention  
 122 Jackson St.      Seattle

## New Booklets Describe Caterpillar Products

A 32-page booklet, Form No. 10750, "The Caterpillar Diesel D4 Tractor," has recently been published to bring the design and manufacturing points of this tractor before the users' eyes. "The Power for Crushing and Screening Plants," Form No. 11467, reviews the company's various sizes of Diesel engines used for crushing plant operations. "Caterpillar Diesel Engines and the Work They Do," Form No. 11463, is a publication depicting the line of Caterpillar Diesel industrial engines, marine engines and electric sets operating in their varied capacities on jobs throughout the world. A publication illustrating track-type and rubber-tired Diesel tractors working where vast quantities of overburden are to be removed is "Working the Open Pits," Form No. 11460. "Industrial Uses for Caterpillar Diesels," Form No. 11620, is a booklet describing functional efficiency of track-type tractors, Diesel engines and Diesel electric sets operating both as prime and auxiliary units in industries throughout the world.

All booklets mentioned above can be secured from Caterpillar Tractor Co., Peoria 8, Ill. State form number.

## Joy Opens Idaho Sales Office

The Joy Manufacturing Company announces the opening of a new sales office and warehouse in Kellogg, Idaho.

The office will be under the direction of K. A. Lehner, sales manager of the Salt Lake City district, with Norman Visnes, the direct representative, residing at Kellogg.

**ROOT & SIMPSON, INC.**  
 Metallurgical Chemists and Assayers  
 P. O. Box 2089      Denver 1, Colo.

**FRED W. SHERMAN**  
 Consulting Mining Engineer  
 Mine Examinations, Mineral Examinations,  
 Mine Surveying and Mapping, Reports  
 and Estimates.  
 1550 Montgomery Street, Oroville, Calif.

**Smith-Emery Company**  
 •  
 Assayers  
 Chemists  
 Engineers  
 Mill Tests and Design  
 Ore Shipments Certified  
 •  
 920 SANTEE STREET, LOS ANGELES

**ORE TESTING** Design & Construction  
 For Complete  
**SOUTHWESTERN ENGINEERING CO.**  
 Mine Surface  
 Installations  
 4800 Santa Fe Ave.  
 Los Angeles 11, Calif. 

**W. H. STOWELL & CO.**  
 Chemists and Assayers  
 421 Sprague Ave.      Spokane, Wash.  
 Estb. 1890

**SEAL-TITE TAMPING BAGS** Save Time and Money in handling Dummies  
 High wet strength and toughness withstand humidity and hard handling. Supplies of dummies are made up quickly and can be stored underground under wet conditions. Send for samples.  
  
**Tamping Bag Co.**  
 210 S. THIRD ST.  
 MT. VERNON, ILL.

**SEWELL THOMAS**  
 Consulting Mining Engineer  
 Plant Layout • Design • Detailing  
 Mechanization • Mining Methods  
 380 Gilpin St.      Denver 3, Colo.

**UNION ENGINEERING CO.**  
 MINE EXAMINATIONS  
 DESIGN AND CONSTRUCTION OF  
 MINING PLANTS AND MILLS  
 510 So. Spring St., Los Angeles 13, Calif.  
 Tel. MU 8550

**PLACER DREDGES**  
 Dragline fed floating and Dryland Placer Dredges. Universal Portable Placer test machine for immediate deliveries. Your inquiries invited.  
**UNIVERSAL DREDGE MFG. CO.**  
 609 Security Life Bldg.  
 Denver 2, Colorado

**VAN WATERS & ROGERS INC.**  
 Flotation Chemicals • Mining Reagents  
 Largest and Most Complete Stocks  
 in Northwest  
 Seattle, Spokane, Portland, Boise

**WOOD ASSAYING CO., HENRY E.**  
 Established 1878  
 ASSAYERS and CHEMISTS  
 2042 Broadway      Denver 2, Colorado

# DEPENDABLE REBUILT EQUIPMENT FOR YOUR MINE & MILL

## DIESEL GENERATORS

- 3—D-13000 Caterpillar Diesel Engines, direct connected to 75 KW, 440 Volt AC Generators
- 1—D-4400 Caterpillar Diesel Power Unit, V-belted to 220 Volt AC Generator. (Will sell with or without Generator)

## PUMPS—SAND

- 3—2" Split Case Wilfley Pumps—Rubber Lined—Motorized
- 3—2" Wilfley Pumps—Solid Bowls—Rubber Lined—Motorized
- 1—1" Wilfley Pump—Motorized
- 4—2" Wilfley Pumps—Motorized
- 1—1½" Denver Vertical—Motorized

## PUMPS—CENTRIFUGAL

- 2—1½ RVH-10 Ingersoll-Rand, Motor Mounted, bronze-lined
- 3—1½ RV-3 Ingersoll-Rand, Motor Mounted, bronze-lined
- 2—2RV-1 Ingersoll-Rand, Motor Mounted, bronze-lined
- 1—RVH-7½ Ingersoll-Rand, Motor Mounted, bronze-lined
- 5—RVH-15 Ingersoll-Rand, Motor Mounted, bronze-lined
- 1—3RVH-25 Ingersoll-Rand, Motor Mounted, bronze-lined

## AIR COMPRESSORS

- 1—8½ x 4¾ x 5 Chicago Pneumatic Air Compressor, 277 cu. ft. displacement, V-belted to a D-4400 Caterpillar Diesel Engine

## FLOTATION MACHINES

- 1—±18 Denver Sub "A", 6 cell, wood tank
- 1—±12 Denver Sub "A", 6 cell, steel tank
- 4—±24 Denver Sub "A", 8 cell, wood tanks
- 1—±18 Weinig, 8 cell, steel tank

## PUMPS—HYDROSEAL

- 1—2" Allen-Sherman-Hoff—Motorized
- 3—6" Allen-Sherman-Hoff—Motorized
- 1—8" Allen-Sherman-Hoff—Motorized

## MAGNETIC PULLEYS

- 1—24" x 26" Dings Stainless Steel Face Magnetic Pulley Conveyor, 5' 6" Centers, with 1 HP Gearhead Motor and M. G. Set.
- 1—24" x 26" Face Dings Magnetic Pulley, 250 Volts DC without charger

## BALL MILLS

- 1—No. 64 Marcy
- 1—No. 45 Marcy
- 1—6 x 7 Allis-Chalmers

## CLASSIFIERS

- 1—6" x 22" Dorr Type Duplex Rake Classifier
- 1—45" x 17 3/4" Akins High Weir Spiral Classifier
- 1—60" x 23" Denver Equipment, Simplex Cross Flow Classifier

## CONDITIONERS

- 6—6' x 8' Deveraux Type, Center Well

## THICKENERS

- 1—16' x 10' Dorr, Wood Superstructure and Tank
- 1—20' x 8' Dorr, Steel Superstructure and Wood Tank
- 1—20' x 8' Booth-Thompson, Steel Superstructure, Wood Tank (all units complete with Motors and Pumps)

## BELT CONVEYORS

- 2—24", 15' to 75' Long, with Ding's Pulleys
- 1—30", 30' Long, with 2 HP Gearhead Motor and new Belt
- 1—30", 70' Long, with Driving Mechanism
- 1—36", 50' Long, with Driving Mechanism

## PUMPS—DEEP WELL

- 3—4" Peerless—Motorized
- 1—4" Layne & Bowler—Motorized
- 1—8" Peerless—Motorized

## SLUSHER HOISTS

- 1—Ingersoll-Rand, 3-Drum, direct connected to 50 HP AC Motor with two 1½ Yd. Crescent Scrapers (used 30 days)

## FILTERS—DISC

- 2—4", 6 Disc, Eimco, with vacuum equipment

## CRUSHERS

- 1—9" x 40" Austin-Western
- 1—10" x 20" Allis-Chalmers
- 1—24" x 20" Jeffrey Swing-Hammer Mill

## DENSITY CONTROLLERS

- 1—±197 Masco, with reversing motor, Copper Tube Immersion Bells and 4" Water Control Valve

## RAILS

- 10 Tons—16 Lb.
- 15 Tons—40 Lb.
- 50 Tons—65 Lb.
- Plate Frog Switches—30± to 60±

## LABORATORY EQUIPMENT

- 1—±13-B Wilfley Concentrating Table
- 1—Braun Pulverizer
- 1—7" x 14" Denver Lab. Rod Mill—Motorized
- 1—Troemner Solution Scale
- 1—Ro-Tap Sieve Shaker
- 1—Denver Lab. Jig

WRITE FOR OUR BULLETIN NO. 9 AND UTAH LIST  
Yards: DENVER AND FLORENCE, COLORADO

# FLORENCE MACHINERY & SUPPLY CO.

C. J. PARRISH, Manager

Suite 904, Equitable Bldg.

Phone Alpine 2803

Denver 2, Colorado



## New Southern California Distributor for Cummins

Cummins Service & Sales, Cummins Engine distributors for Southern California, headed by Jim Flanagan and Syd Cook, announce the opening of considerable expanded facilities at Bakersfield. These facilities are adequate to take care of the expanding number of Cummins users in Kern County and adjacent neighborhood.

A complete new Parts Department has been installed providing sufficient space to carry a large enough Cummins stock to take care of all customer's needs. A new unit rebuild shop is also in operation. This shop has the most up-to-date equipment available, including pump test stand, all special Cummins tools and fixtures and engine stands especially designed for economical and efficient engine assembly. A complete inspection department embracing all necessary gauges and other tools for rapid inspection of all Cummins parts is also in operation.

The expanded facilities will be under the management of Earl Swallow, who has been Cummins' manager in this area for the past several years. Cliff Woods remains in charge of service; and the organization has been augmented to take care of all Cummins users needs.

## MACHINERY IMMEDIATELY AVAILABLE

- 1—5' x 4' Denver ball mill with 50 H.P. slipring motor drive
- 1—5' x 4' Union Iron ball mill, with countershaft, 60" dia. clutch pulley
- 1—27" x 14" 6' Union rake classifier
- 2—24" x 24" Union iron flotation machines, 4 and 5 cell
- 1—18" Bendalari utility jig
- 1—16" x 24" Denver duplex jig
- 8—jaw crushers: 2x3, 3x36, 6x20, 8x15, 9x24, 10x20, 11x20, 24x36
- 1—3' x 6' Kennedy Van Saun airflow ball mill
- 2—2' Symons cone crushers
- 1—7 1/2' x 7 1/2' wood cyanide tank
- 1—20" Allis-Chalmers gyratory crusher
- 1—2 cu. yd. Sauerman slackline bucket with carriage
- 1—984 c.f.m. I.R. air compressor
- 1—66" x 36" Madsen rotary dryer
- 1—D-13000 Cat. diesel power unit

WRITE, WIRE OR PHONE

## WASHINGTON MACHINERY AND STORAGE COMPANY

7329 E. Marginal Way, Seattle 8, Wash.  
Phone: RAInier 1123

## THE MARKET PLACE

Mine Supt. foreign, house &	\$650	Asst. Mine Manager, U. S.	\$8,000-9,000
Mine Engineer, Exploration, foreign	600	Geologist, U. S.	350
Asst. Chief Mech., Eng., Mine, ign.	Open	Mine engineer, U. S.	250-300
Mine Engineer, Open Pit Plans, ign.	Open	Metallurgist, U. S.	350
Master Mech., (3) Mines, ign.	\$450-\$500	Jr. mine engineer, U. S.	300
Mill Supt., (2) ign.	500	Mill engineer, U. S.	250-300
Research Chemist or Forestry Grad.	Open	Assayer, U. S.	275
Asst. Mine Supt., foreign	450	Chemist, U. S.	250
Mine Geologist, U. S. \$200, foreign	350	Instructors Civil, Electrical, Mechanical and Chemical Engr.	300
Chief Draftsman, Mine, foreign	600	Electrician, U. S.	350-400
Draftsman, Mill Designers, U. S., ign.	\$350-500	Mechanical draftsman, U. S.	425
Designer, E. E., Colorado	425	Structural draftsman, U. S.	400
Civil Engr., Field Work, ign.	450	Mill designer, U. S.	500
Field Engr., Construction, U. S.	\$400-450	Mill draftsman, U. S.	350
Metallurgists, ign. (3)	\$350 & 400	Mill mechanic, U. S.	250
Metallurgist, Roast., Smelt, exp., U. S.	Open	Mechanical engineer, U. S.	500
Metallurgist, Colorado, start	250	Journeyman electrician, U. S.	315
Jr. Metallurgist, U. S.	290	Metallurgical engineer, U. S.	400
Asst. Smelter Eng., E. Mech., ign.	525	Flotation shift boss, U. S.	250
Mine Foreman (2), ign.	\$375-385	Metallurgical engineer, ign.	300
Mine Engineers, U. S., So. Am.	\$240-500	Smelter foreman, ign.	400
Chemists, Research (2), U. S.	\$275-300	Master mechanic, ign.	425
Mine Shifters, ign., S. A. & C. A.	\$250-350	Mine foreman, ign.	375
Mine Shifters, U. S. (2)	335	Jr. mine engineer, ign.	335
Cyanide Flot. Shifters, ign.	\$250-375	Chief draftsman, ign.	540
Refinery Foreman, (3) Smelting, ign.	350	Chemist, ign.	325
Mine Eng., U. S. (2) \$320, ign.	300	Electrical foreman, ign.	400
Assayer, foreign	325	Mine engineer, ign.	400
Chemists (2)	305	Asst. mine supt., ign.	350
Elect. Supt., Mine, ign.	450	Assayer, ign.	300
Elect. Foreman, Mine, U. S.	407	Diesel engineer, ign.	425
Chief Elect. (E.E.), Mine, ign.	365	Mine shift boss, ign.	325
Electrician, Diesel Oper.	400	Cyanide mill shift boss, ign.	300
Elect'n-Mechanic, Mine, Mex.	400	Mechanical engineer, ign.	700
Mine Warehouseman, ign.	400	Electrical supervisor, ign.	400
Steno., Single, ign., translation	315	Mill supt., ign.	700
		Mine warehouseman, ign.	450
		Mine accountant, ign.	400
		Stenographer, ign.	325
		Metallurgical accountant, ign.	425
		Chief mine clerk, ign.	500

## GLENN B. WILSON

Employment Specialists

307 CONTINENTAL OIL BUILDING  
DENVER 2, COLORADO

## FOR SALE Immediate Delivery

- 1—1,000 cu. ft. Synchronous Motor driven Compressor, with 175 HP, 440 volt Motor built on Compressor shaft, with accessories and large air receiver.
- 1—18"x30" Allis Chalmers Blate type Crusher with 440 volt Motor and drive, Like new, used only short time.
- 1—20" Belt Conveyor, 90 ft. centers, complete with belt, speed reducer, motor and drive, A-1 condition.
- 1—20 KW Motor Generator Set, with 440 volt 30 HP, 1,800 RPM Motor direct to 125 volt D.C. Generator, like new.
- 1—Merrick Weightometer Model E, for 24" belt, like new.
- 1—42"x10 ft. S & A Steel Apron Feeder with speed reducer, motor and drive.
- 1—36"x80 ft. Belt Conveyor with motor and drive.

## WESTERN MACHINERY COMPANY

124 E. Buchanan St.  
Phoenix, Ariz.

P. O. Box 3465

Ph. 34101

## AIR COMPRESSORS

ELECTRIC: 1302, 1578, 2200 and 3700 Ft.  
DIESEL: 528, 676 and 1078 Ft.  
BELTED: 528, 676, 1081 and 1302 Ft.

DARIEN CORP.

60 E. 42nd Street, New York 17, N. Y.

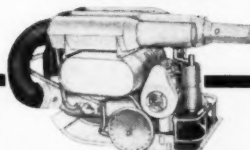
## BUSINESS MEN'S CLEARING HOUSE

601 Midland Savings Bldg.

Denver 2, Colorado

Established 1903

## SALE



## PORTABLE HEATERS

Complete with flexible ducts. Excellent operating condition guaranteed.

Especially adaptable for  
MINE USE

STEWART-WARNER portable powerful 100,000 BTU gasoline-burning Heaters complete with turbine type blower and 1 1/2-hp. air-cooled ball-bearing engine.

## PORTABLE SELF-POWERED MANY PURPOSE HEATER

HEATING — Mills, Bunkhouses, Dry Rooms, Large Boarding Houses, Shops, Sheds, Warehouses, Buildings Under Construction, Spot Heating, etc.

THAWING — Thawing Frozen Ore, or Preventing Freezing in Ore Bins, Thawing Frozen Areas, Machinery, Pipe Lines, Tanks, etc.

DRYING — Drying Concentrates or Ore in Conjunction with Tumbler, Dry Wet Ore in Bins; Dry Plaster, Paint, Mortar, etc.

PRE-HEATING — Engines, Tractors, Trucks, Equipment, etc.  
Original Cost . . . . . \$583.00

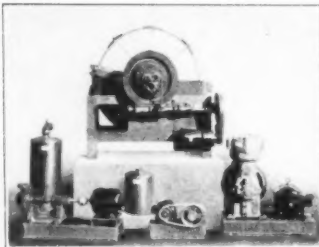
SALE  
PRICE **\$195.00**

Electric Heaters also in Stock  
Send for Literature

## BERNSTEIN BROTHERS

Since 1890  
PUEBLO Dept. M-3 COLORADO

# Mining and Concentrating Machinery LARGE STOCK—FULLY RECONDITIONED



## FILTERS

- 1—3' x 4' Oliver Drum Filter
  - 1—6' x 3 disc American continuous disc filter
  - 1—6' x 4 disc American continuous disc filter
- All filters complete with necessary vacuum equipment

## CONCENTRATING TABLES

- 1—Wilfley Table, No. 11-D Right Hand
- 25—Wilfley Tables, No. 6, Right Hand
- 1—Wilfley Table, No. 6, Left Hand
- 24—Deister "Plat-O" Tables, Right Hand
- 35—Deister "Plat-O" Tables, Left Hand
- 2—No. 12 Wilfley half-size tables

## BALL AND ROD MILLS

- 1—4' x 4' Colorado Iron Works New Ball Mill
- 1—5' x 22" Hardinge Conical Ball Mill
- 1—6' x 36" Hardinge Conical Ball Mill
- 1—6' x 8" Marcy Ball Mill
- 1—8' x 22" Hardinge Conical Pebble Mill
- 1—3' x 8" Denver Engineering Company Tube Mill
- 1—3' x 9" Ruth Rod Mill
- 1—4' x 11" Ruth Rod Mill

## TUGGER HOISTS

- 31—Ingersoll-Rand Size EU, Single Drum Standard Utility Air Hoists
- 1—Ingersoll-Rand Single Drum Little Tugger Air Hoist, Model 6-HC
- 3—6 1/2 HP Sullivan Single Drum Electric Tugger Hoists, 250 volts DC
- 9—6 1/2 HP Sullivan Double Drum Electric Tugger Hoists, 250 volts DC
- 1—25 HP Sullivan Two Drum Electric Slusher Hoist, Model B-211

## JAW CRUSHERS

- 1—8' x 8" Universal, semi-steel
- 1—9' x 18" Cedar Rapids, all steel
- 1—8' x 24" Rogers, cast steel
- 1—8' x 36" Universal, all steel
- 1—15' x 20" Universal, all steel
- 1—24' x 36" Traylor, Type A Blake

## SAND PUMPS

- 1—2" Wilfley Sand Pump
- 1—3" Telluride Centrifugal Sand Pump
- 1—3' x 3" Allen-Sherman-Holl Hydro-seal Rubber Lined Sand Pump
- 1—4' Traylor Centrifugal Sand Pump
- 2—6" Wilfley Sand Pumps

## MOTORS, SLIPRING

- 1—15 HP Westinghouse Slipring, 3 60/440, 1,200 RPM
- 3—20 HP General Electric Slipring, 3 60/220, 1,200 RPM
- 1—25 HP Westinghouse Slipring, 3 60/440, 1,160 RPM
- 1—40 HP General Electric Slipring, 3 60/440, 850 RPM
- 1—50 HP Westinghouse Slipring, 3 60/440, 1,160 RPM
- 2—52 HP General Electric Slipring, 3 60/220, 850 RPM
- 1—52 HP General Electric Slipring, 3 60/440, 550 RPM
- 1—60 HP General Electric Slipring, 3 60/440, 600 RPM
- 1—75 HP Westinghouse Slipring, 3 60/440, 720 RPM
- 1—82 HP General Electric Slipring, 3 60/440, 495 RPM
- 1—100 HP General Electric Slipring, 3 60/440, 695 RPM
- 2—165 HP General Electric Slipring, 3 60/440, 450 RPM
- 1—20 HP Allis-Chalmers Slipring, 3 60/2200, 895 RPM
- 2—30 HP General Electric Slipring, 3 60/2200, 900 RPM
- 1—300 HP General Electric Slipring, 3 60/2200, 590 RPM

## ORE CARS

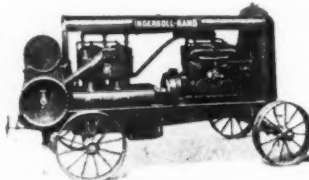
- 1—12 cu. ft. Rocker Dump, 18" gauge
- 3—18 cu. ft. Rocker Dumps, 18" gauge
- 2—20 cu. ft. Rocker Dumps, 24" gauge
- 6—23 cu. ft. Rocker Dumps, 18" gauge
- 2—24 cu. ft. Rocker Dumps, 18" gauge
- 3—55 cu. ft. Rocker Dumps, 30" gauge
- 12—84 cu. ft. Rocker Dumps, 36" gauge
- 6—2 cu. yd. Koppel Rocker Dumps, 36" gauge
- 1—14.3 cu. yd. Koppel Rocker Dump, 36" gauge
- 1—14.3 cu. ft. End Dump, 18" gauge
- 3—14 cu. ft. Gable Bottom, 18" gauge
- 1—4 cu. yd. Austin-Western 2-way Side Dump, 24" gauge

## LOCOMOTIVES

- 2—2 to 2 1/2 ton Mancha Battery Locomotives, 18" gauge
- 1—2 1/2 ton Whitcomb Battery Locomotive, 24" gauge
- 2—5-ton Jeffrey Battery Locomotives, 42" gauge
- 1—5-ton Mancha Battery Locomotive, 36" gauge
- 1—7-ton Mancha Battery Locomotive, 36" gauge
- 2—7-ton General Electric Battery Locomotives, 36" gauge
- 1—3-ton Ruth Gasoline Locomotive, 18" gauge
- 1—3-ton Whitcomb Gasoline Locomotive, 24" gauge
- 3—6 1/2-ton General Electric Trolley Locomotives, 36" gauge

## MISCELLANEOUS EQUIPMENT

- 1—8' x 12" Simplex Denver Mineral Pulverizing Jig
- 2—New Jeffrey Vibrating Feeders, Type 2A
- 1—50 KW Diesel Electric Generating Set
- 1—New Ainalay Centrifugal Gold Separator
- 2—3' x 5' Tyler "Hammer" Electric Vibrating Screens



## COMPRESSORS

- 1—5 and 5 and 4x4 Ingersoll-Rand Vertical, two-stage Compressor, 60 CFM
- 1—10 1/2' x 4 1/2' x 6" Rix Vertical Compressor, 172 CFM, 300 lbs. pressure
- 1—12' x 6 1/2' x 10" Ingersoll-Rand Horizontal Compressor, 293 CFM, 100 lbs. pressure
- 1—14' x 7 1/2' x 12" Ingersoll-Rand Compressor, 447 CFM, 100 lbs. pressure
- 1—14' x 12" Ingersoll-Rand Compressor, 528 CFM, 100 lbs. pressure
- 1—16' x 7' x 18" Ingersoll-Rand Compressor, 554 CFM, 300 lbs. pressure
- 1—14' x 8 1/2' x 10" Sullivan Compressor, 637 CFM
- 1—18' x 11' x 16" Ingersoll-Rand Compressor, 800 CFM
- 1—19' x 12' x 16" Ingersoll-Rand Compressor, 888 CFM
- 1—5 1/2' x 5" Schramm 120 CFM Portable Compressor, powered by Buda 30 HP Gas Engine
- 1—240 CFM Gardner-Denver Portable Compressor, driven by 67 HP Buda Gas Engine
- 2—310 CFM Gardner-Denver Portable Railroad Type Compressors, driven by Buda Gas Engines
- 1—9' x 6" Ingersoll-Rand Compressor, 153 CFM, 40 lbs. pressure
- 2—12' x 6" Ingersoll-Rand Compressors, 273 CFM, 15 lbs. pressure
- 1—16' x 12" Union Compressor, 698 CFM, 60 lbs. pressure
- 1—13' x 10" Laidlaw Duplex Compressor, 840 CFM, 60 lbs. pressure
- 2—10 HP Vertical Boilers, complete with Ray Oil Burners
- 1—40 HP American Vertical Boiler
- 2—50 HP Vertical Boilers
- 3—50 HP Locomotive Type Boilers
- 1—75 HP Vertical Boiler
- 2—40 HP Lewellyn Locomotive Type Boilers
- 1—90 HP Broderick Locomotive Type Boiler
- 3—90 HP Kewanee Locomotive Type Boilers
- 1—100 HP Oil City Water Tube Boiler
- 2—100 HP Horizontal Return Tubular Boilers
- 1—125 HP Locomotive Type Boiler
- 1—150 HP Horizontal Tubular Boiler
- 1—150 HP Kewanee Horizontal Return Tubular Boiler
- 2—250 HP "Stirling" Babcock & Wilcox Water Tube Boilers
- 2—500 HP "Stirling" Babcock & Wilcox Water Tube Boilers

## GYRATORY CRUSHERS

- 1—10" Traylor "Bulldog"
- 1—No. 6—Kennedy-Van Saun
- 1—No. 37—Kennedy Van Saun

- 1—3' Symons Cone Crusher, fine cone, approximate weight 25,800 lbs., HP required 50 to 60, rpm 580

SEND FOR OUR RECONDITIONED STOCK LIST BULLETIN NO. 481  
REBUILDERS OF MINING AND CONCENTRATING MACHINERY SINCE 1898

BETTER MACHINERY — IT'S FULLY RECONDITIONED

ESTABLISHED 1898

**MORSE BROS. MACHINERY CO.**

P.O. BOX 1708

DENVER, COLORADO, U.S.A.

CABLE "MORSE"



## THE MARKET PLACE

### CHANGE OF ADDRESS

CIRCULATION DEPARTMENT  
MINING WORLD with which is combined the Mining Journal  
121 Second St., San Francisco 5, Calif.

Please change the address of my Mining World subscription.

NAME \_\_\_\_\_

OLD ADDRESS \_\_\_\_\_

NEW TITLE OR POSITION \_\_\_\_\_

NEW ADDRESS \_\_\_\_\_

NEW COMPANY CONNECTION \_\_\_\_\_



We Have Stock

### DRESSER COUPLINGS

All Sizes

Bolted and Boltless Types

Style 38

Permanent Joints for Steel and Cast Iron Pipe

### PACIFIC PIPE COMPANY

407 Folsom Street

San Francisco 5

MINES - MILLS  
•  
RAILROADS  
•  
MACHINERY  
•  
COMPLETE PLANTS

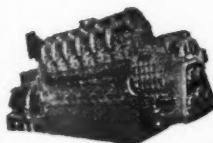
BOUGHT-SOLD  
LIQUIDATED



**DULIEN STEEL  
PRODUCTS, INC.**

*of Washington*

9265 E. MARGINAL WAY  
LANDER 6000  
SEATTLE 8, WASH.



**DIESEL  
GENERATOR PLANTS**  
FOR  
**IMMEDIATE DELIVERY**



1000 KW. 2400 Volts. 3 Phase. 60 Cycle. 720 RPM. General Motors Model 16-278A  
750 KW. 2400 Volts. 3 Phase. 60 Cycle. 720 RPM. General Motors Model 12-567  
600 KW. 2400 Volts. 3 Phase. 50 Cycle. 600 RPM. General Motors Model 12-567  
300 KW. 450/2400 Volts. 3 Phase. 60 Cycle. 1200 RPM. General Motors Model 8-268A  
200 KW. 450/2400 Volts. 3 Phase. 60 Cycle. 1200 RPM. General Motors Model 8-268A  
50 KW. 440 Volts. 3 Phase. 60 Cycle. 900 RPM. Fairbanks Morse Model 36A 3 1/2  
100 KW. 3 Wire. 125/250 Volts D.C. 1200 RPM. General Motors Model 3-268A  
900 HP. General Motors Model 12-567 Propulsion Unit Complete

### HERCULES ELECTRIC MACHINERY and EQUIPMENT CO.

Tel. Nevada 6-2808  
Cable Address HEMCOY

1412 So. Alameda Street  
Compton, California

*Buyers of*

Ores • Slag • Slimes  
Fumes • Precipitates  
Concentrates

*Containing*

Thalium • Tantalum • Rhenium  
Ruthenium • Germanium  
Cobalt • Thorium • Vanadium  
Indium • Gallium • Cadmium  
Bismuth • Columbium  
Rare and Semi-Rare Metals

Send analysis and prepaid representative sample stating quantity available, to . . .

**METALLURGICAL  
PRODUCTS COMPANY • EST. 1909**  
35th & Moore Streets, Phila. 45, Pa.

**BALL MILLS  
CLASSIFIERS  
CRUSHERS  
TRUCKS**

**MINE CARS  
MILL BUILDINGS  
PIPE**

**LUMBER  
MOTOR  
ENGINES  
MUCKERS**

The following very late type reconditioned 2 stage compressors are available for immediate delivery:

- |   |   |
|---|---|
| 1-60' Schramm Skid Mounted Gas Engine               | 1-315' Chicago Pneu Steel W/Steel Wheels                      |
| 1-210' Le Roi Pneu Mounted Gas Engine               | Caterpillar Diesel Engine                                     |
| 1-210' Chicago Pneu Skid Mounted Gas Engine         | 2-210' Sullivan Skid Mounted Gas Engine                       |
| 1-210' Chicago Pneu Steel W/Steel Wheels Gas Engine | 1-RH Caterpillar Tractor, La Plante Choate                    |
| 2-210' Sullivan Steel W/Steel Wheels Gas Engine     | Dozier, 1275 Hours  |
|   | 1-Case Tractor Solid Rubber with Roustabout Crane Turns, 360' |

(WHAT WE DO NOT HAVE, WE WILL LOCATE)

### EQUIPMENT SUPPLY COMPANY

2750 Atlantic Blvd. • Long Beach, Calif. • Phone: 444-42

### Market Place Advertising

1 to 44 inches per year.....	\$5.00 per inch
45 to 89 inches per year.....	\$4.50 per inch
90 to 179 inches per year.....	\$4.00 per inch
180 to 359 inches per year.....	\$3.50 per inch
360 or more inches per year.....	\$3.00 per inch

Space is measured by the column inch, three columns to the page.  
Closing date: 15th of month preceding publication.  
(Used and reconditioned equipment, liquidations, property sales only)

## INDEX OF ADVERTISERS

Allen-Sherman-Hoff	Inside Front Cover	Chicago Pneumatic Tool	15	Joy Manufacturing Co.	12, 13
Allis-Chalmers Mfg. Co. (General Machinery Div.)	27	Christensen Diamond Products	50	Mace Co.	55
Allison Steel	66	Coast Manufacturing & Supply	21	Wack Manufacturing Co.	Inside Back Cover
Alloy Steel & Metals	Outside Front Cover	Colorado Iron Works	56	Wagman Copper Co.	61
Anaconda Wire & Rope	69	Commins Engine Co., Inc.	65	Merrick Scale Mfg. Co.	71
American Cyanamid	11	Deister Corp.	77	Metallurgical Products	79
American Forge	63	Deister Concentrator Co.	68	Mine & Smelter Supply Co.	23
American Manganese Steel Division	25	Denver Equipment Co.	47	Morse Bros. Machinery Co.	78
American Brake Shoe Co.	25	Denver Fire Clay	44	Northern Blower Company	5
American Potash	51	The Dow Chemical Co.	28	The Orgood Company	53
American Smelting & Refining	29	Dallen Steel	79	Pacific Foundry Co., Ltd.	51
American Zinc, Lead & Smelting Co.	61	Equipment Supply Co.	73	Pacific Pipe Company	66, 79
Arizona Mining Supply	70	Emaco Concrete Cutting Co.	59	Philpott Co., George W.	71
Bartell, A. O.	59	Euclid Road Machinery	43	Plummer Mfg. Co., W. A.	70
Bemis Bros. Bag Co.	77	Flexible Sewer-Rod	9	Speake Hotel	72
Bernstein Bros.	77	Florence Machinery Co.	76	Standard Oil of Calif.	72
Bethlehem Pacific Coast Steel	24	Gardner-Denver Co.	8	Stolz-Sickles Co.	68
Boyles Bros.	57	General Motors	73	The Timken Roller Bearing Co.	4
Bucyrus-Erie Co.	2	Gowall Rubber Co.	9	Washington Machinery & Storage Co.	77
Bunker Hill & Sullivan	61	Hardinge Company	71	Western Machinery Co.	31
Business Men's Clearing House	77	Harnischfeger Corp.	6, 20	Wiley & Sons	77
C. S. Card Iron Works	45	Hercules Electric Machinery & Equipment	79	Wilson, Glenn B.	77
Caterpillar Tractor	10	Holley, Horace J.	80	World's Minerals	68
		Humphreys Investment Co.	30	Worthington Pump & Machinery Corp.	3
		Industrial Air Products	63	Yuba Manufacturing Co.	26
		International Harvester	1		
		International Smelting & Refining	61		

### THE MARKET PLACE

#### ARIZONA MINING SUPPLY CORP.

PRESOTT, ARIZONA

Ingersoll-Rand Equipment  
DuPont Explosives  
General Electric Motors and Switches  
Goodrich Belting - Shafts  
Steel - Pipe - Mine Rail - Wire Rope  
Lumber - Building Supplies  
Electric Motor Service

#### INDUSTRIAL MACHINE SHOP

Blacksmith - Welding  
Machinists - Hot Bit Milling  
"ARIZONA'S REAL SUPPLY HOUSE"

6 ft. x 48 in. Hardinge Ball Mill, with or without Air Separator.  
1 1/2 Sturtevant Ring Roll Mill.  
45-ton Plymouth Diesel Locomotive.  
3 ft. x 5 ft. Hummer 3-Deck Screen.  
24 in. x 48 in. Link-Belt Apron Feeder.  
4 1/2 ft. x 30 ft. Refractory Lined Rotary Kiln.  
36 in. x 24 in. Traylor Jaw Crusher.  
70 in. x 35 ft. Ruggles Coles XB Indirect Dryer.  
8 ft. and 10 ft. Grayco Air Separators.  
1-40" x 48" and 1-42" x 54" Buchanan Blake Type Panel Sections Jaw Crushers.

#### DARIEN CORP.

60 E. 42nd ST., NEW YORK 17, N. Y.

#### FOR SALE BY OWNER

Davis Crushing Rolls, 14" x 28" dia. New facing and bronze journals. Also 2-3' x 8' all steel double deck vibrating screens.

HORACE J. HOLLEY

1809 California St., San Francisco 9, Cal.  
Phone: Jordan 7-0920

### CLASSIFIED SECTION

6c per word (8 pt. type) \$3.00 minimum. 10c per word (10 pt. type).

(For Box numbers addressed to Mining World, add 50c)

See Market Place Section for Display Classified Rates

Closing Date: If proof required 15th of preceding month, otherwise 25th

### Business Opportunities

WANTED: Company with machinery and experience in placer mining wanted to work gold mine in well known British Columbia Cariboo district on a percentage basis. Write Box T-45, MINING WORLD, 121 Second Street, San Francisco 5, California.

### Equipment For Sale

FOR SALE—Whites Gulch, Sawyers Bar, Siskiyou County, California. Placer mine, consisting of nine claims, good furnished house, outbuildings, water rights, ditches, sluice boxes, pipe, giant, water wheel, derrick and miscellaneous equipment. Ready to operate. Reasonably priced. Contact R. P. Lutzi, 1450 - 23rd Avenue, San Francisco, California.

### FOR SALE

Large developed good lead property.  
Also good gold property.

P. O. BOX 362 • DENVER, COLORADO

FOR SALE: Rainbow Spar, fluorspar mine. Good milling proposition with vast quantities of milling ore in place. The mine is located in southern Utah, is two miles off Highway 91, and can be worked the year 'round. Reasonable. Contact Brice Prisky or Lawrence Prisky, Joseph, Utah, Box 3.

FOR SALE at reasonable price: 320 acres of deeded land. Desert area, mostly level. Elevation 5,000 ft. Good home and other buildings. Four gold and silver mining claims with small mill. Getting too old to operate. Write Box T-44, MINING WORLD, 121 Second Street, San Francisco, California.

### FOR SALE

Christensen Diamond Drill, Model 1S. Wisconsin motor, complete accessories, core bit and casing bit. Has drilled only 15 holes. SACRIFICE.

UNIVERSAL DREDGE MFG. COMPANY  
609 Security Life Bldg. Denver, Colo.

### Second Hand Diamond Drill Equipment

#### FOR SALE

E. R. MATHENY

Diamond Drill Contractor  
512 West Seventh Street  
Silver City, New Mexico

FOR SALE: Marcy ball mill, crushers, Humphrey's Spiral, pumps, motors and other surplus mill equipment. Inspect at Pacific Bridge Company, Park City, Utah, or contact Pacific Bridge Company, 333 Kearny, San Francisco.

### Positions Available

WANTED: To contact two hard rock miners to drive a 265-foot water tunnel. Contact J. B. Dixon, Water Supt., 231 E. Grand Ave., Escondido, California. Phone Escondido 57.

### Positions Desired

ENGINEER AND SUPERINTENDENT—Past seven years in charge of production large fluorspar company Southern Illinois. Fifteen years production and engineering Rocky Mountain region. Available 30 to 60 days. Write Box T-46, MINING WORLD, 121 Second Street, San Francisco, California.

MINING ENGINEER—20 year's experience in underground operating and engineering. Substantial experience in construction, diamond drilling, and mining exploration. Available on short notice. Write Box 152, Osburn, Idaho.

### Miscellaneous

1 new type patented crushing grinding mill available for demonstration and free use for right party and property. See George R. Marvin Company, 1601 Taylor Way, Tacoma 2, Washington, for proposition. Offer made for purpose of getting new type mill into operation.



# WHAT'S NEW

## in OFF-HIGHWAY TRUCK DESIGN?

**MACK**

in the  
mines  
and in the  
quarries

**Mack**

**Mack**  
MODEL LRSW

**Mack**

**LV**

**Mack**  
LMSW-M

all-highway—truck  
or tractor

• You'll find the answer in Mack's new series of folders describing Mack truck models in payload capacities up to 55 tons.

These colorful, fully-illustrated folders give you complete, up-to-the-minute information on new developments in Mack super-duty truck design. They also describe the many outstanding and exclusive Mack features that assure lower costs and more profitable operation.

Before you buy any truck — in any capacity range — for pit or strip mining, for quarrying or other excavating work, it will pay you to get the facts on tough, dependable Macks.

Fill in the coupon below and we will gladly send you a complete set of these folders by return mail. No obligation on your part, of course.

IT'S PART OF THE LANGUAGE:

Built Like a **Mack** Truck

Mack Trucks, Inc., Empire State Building, New York 1, New York. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J.; Long Island City, N. Y. Factory branches and dealers in all principal cities for service and parts. In Canada: Mack Trucks of Canada, Limited.

**OFF-HIGHWAY AND MINING DEPT.**

Mack Trucks, Inc.  
Empire State Building, New York 1, N. Y.

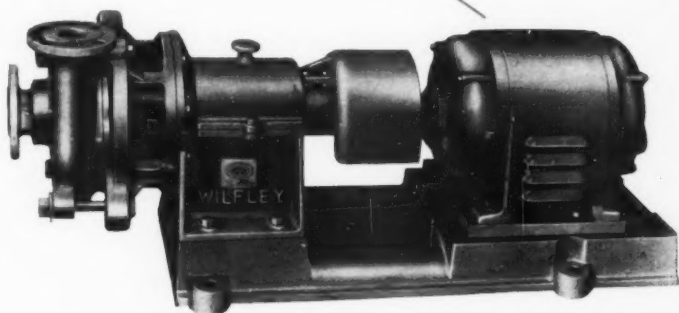
Gentlemen: Please send me your five new folders describing Mack truck models for off-highway operation.

NAME

COMPANY

STREET ADDRESS

CITY AND STATE



## for ACIDS

**T**his is the dependable, modern acid pump that eliminates trouble in chemical production.

It handles acids, corrosives, hot liquids, and mild abrasives with cost-saving efficiency. You can count on it 24 hours a day, month after month without attention. 10-to 2,000-G.P.M. capacities; 15-to 150-feet heads and higher. Individual engineering on every application. WILFLEY is the pump to buy when you want dependability PLUS lower operating costs. Write or wire for complete details.

• WILFLEY • WILFLEY • WILFLEY •  
**WILFLEY**  
FLI • WILFLEY • WILFLEY •  
**centrifugal PUMPS**  
• WILFLEY • WILFLEY • WILFLEY •

**A. R. WILFLEY & SONS, INC.**  
DENVER, COLORADO, U. S. A.  
New York Office: 1775 Broadway, New York City